

Territories of scarcity and creativity: a critical view of informal settlements and emerging tactics under conditions of scarcity in Nairobi, Kenya and Quito, Ecuador

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TERRITORIES OF SCARCITY AND CREATIVITY
A Critical view of Informal Settlements and Emerging Tactics under
Conditions of Scarcity in Nairobi, Kenya and Quito, Ecuador

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This thesis explores the processes through which scarcity is constructed in informal settlements and how conditions emerging within its limits gives way to particular socio-spatial phenomena and influence the emergence of self-organisation and creative strategies from a non-expert perspective. At the same time, this thesis deconstructs these emerging tactics (reactive and transformative) in a diagrammatic way to generate a critical study of their potential for socio-spatial change that goes beyond the everyday survival.

Most people associate scarcity with “not having enough” of something, most usually of a material nature. In contrast, this paper is based on the premise that scarcity is a constructed condition, therefore exploring it beyond its immediate manifestation and illustrating its discursive, distributive and socio-material components. In this line, the research uses Assemblage Theory as both an approach and a tool for analysis. This approach allows the research to depart from everyday narratives of the residents, and gradually evolve into a multi-scalar, non-linear reading of scarcity, by following leads into different realms and unpacking a series of routine events to uncover their connections to wider processes and particular elements affecting the settlement and the city as a whole.

For this purpose, the research is based on a qualitative, flexible and multi-sited methodology, using different case studies as testing grounds. Collected data stems from a 11-months ethnographic fieldwork in informal settlements in Ecuador and Kenya, analysing the socio-spatial practices and strategies deployed by the different actors producing the built environment and arising from everyday and latent experiences of scarcity. The thesis examines the multi-scalar nature of these strategies, including self-building and management tactics, the mobilisation of grassroots organisations, the innovative ways of collaborating deployed by different coalitions and the reformulation of urban development policies.

As outcomes of the research, the thesis will show illustrative diagrams that allow a better understanding of, firstly, the construction of scarcity in the built environment beyond its immediate

manifestation and secondly, the way that emerging tactics a) improve existing conditions of scarcity, b) reinforce the status quo or c) contribute to the worsening of the original condition.

Therefore, this thesis aims to offer lessons with both practical and theoretical considerations, by firstly, giving an insight into the complexity and transcalar nature of the construction of scarcity in informal settlements; secondly, by illustrating how acute conditions related to scarcity gives birth to a plethora of particular phenomena shaping the territory, social relationships and processes; and thirdly, by identifying specific characteristics within the informal that might allow for new readings of the city and possibilities for socio-spatial change under conditions of scarcity.

TABLE OF CONTENTS	1
ABSTRACT	i
ACRONYMS	viii
GLOSSARY OF TERMS	ix
LIST OF FIGURES	x
LIST OF TABLES	xiv
ACKNOWLEDGEMENTS	xv
DECLARATION	xvi
TERRITORIES OF SCARCITY AND CREATIVITY: AN INTRODUCTION	1
1.1 Background (Why scarcity and why in the built environment)	1
1.2 Study area (hypothesis and research questions)	3
1.3 Literature review	3
1.3.1 Theoretical underpinnings Scarcity - From material accounts to socio-spatial realities	4
1.3.2 Informal settlements as territories of scarcity	10
1.3.3 Creativity and its transformative quality	15
1.4 Research Design	19
1.4.1 strategy	20
1.5 Thesis structure	24
AN ASSEMBLAGE APPROACH TO SCARCITY: FROM EXPERIENCED TO CONSTRUCTED SCARCITY	27
2.1 An Introduction to Assemblage: as approach, as descriptor, as mediator of scarcity	29
2.2 Assemblage theory in architectural and urban studies	33
2.2.1 Micro-complexities with macro repercussions: assemblage theory to unravel place and everyday in relation to urban life and urbanisation	33
2.2.2 Negotiation between scales (How place and settlements change)	36
2.2.3 The city as assemblage: complexity, urbanisation and the engagement with politics	38
2.2.4 Relation to urbanisation, inequality and exclusion	39
2.2.5 Limitations	42
2.3 Implications of an assemblage approach for the study of scarcity in the built environment: Towards a Conceptual Analytical Framework	43

2.3.1 Assemblage theory, scarcity and the space of the actual in the built environment	43
2.3.2 Assemblage theory, scarcity and the space of the potential in the built environment	45
TRACING SCARCITY IN THE BUILT ENVIRONMENT: TOWARDS A DIAGRAMMATIC APPROACH	48
PART I. UNDERSTANDING THE CONSTRUCTION OF SCARCITY IN THE BUILT ENVIRONMENT	48
3.1 Capturing everyday stories of scarcity in the built environment	48
3.1.1 Stories of scarcity in their own terms: Photo-voice exercises	50
3.1.2 From everyday stories to multi-scalar enquiries: Further in-depth interviews with other actors and participant observation	52
3.1.3 From capturing experiences of scarcity to a diagrammatic approach	53
3.2 A case for a diagrammatic approach in the study of scarcity in the built environment	54
3.2.1 What a diagram can do for an assemblage approach to scarcity in the built environment - addressing limitations of assemblage thinking	54
3.2.2 What a diagram can do for the critical study of current and potential interventions under conditions of scarcity	56
3.3 Conclusion	57
PART II. CONSTRUCTING THE DIAGRAMMATICAL APPROACH TO SCARCITY	58
3.4 Constructing and understanding the diagram: From experienced towards constructed scarcity	58
3.4.1 Step 1 From everyday narratives to sites of experienced scarcity	58
3.4.2 Step 2 Understanding the Sites: elements and interactions	61
3.4.3 Step 3 Putting the assemblage together: towards a constructed and transcalar reading	77
3.4.4 Step 4 Deconstructing emerging tactics under conditions of scarcity	83
3.5 conclusion	85
DECONSTRUCTING SOCIO-SPATIAL DYNAMICS OF SCARCITY IN MASHIMONI, KENYA	86
PART I DECONSTRUCTING SOCIO-SPATIAL DYNAMICS OF SCARCITY IN THE BUILT ENVIRONMENT OF MASHIMONI	86
4.1 Consolidation of informal settlements in Nairobi	86
4.1.1 An overview of the emergence of informal settlements in Nairobi	86
4.2 An introduction to Mashimoni	89
4.2.1 Current situation: A look outwards, location and relation to its surroundings	89
4.2.2 Current situation: A look inwards, spatial composition and socio-economic overview	91
4.3 Socio-spatial dynamics of scarcity in Mashimoni	93
4.3.1 Lack of adequate sewerage	94
4.3.2 Lack of adequate and flexible housing	115
4.3.3 Lack of adequate toilet facilities	128
4.3.4 lack of adequate waste management	149

PART II - DECONSTRUCTING EMERGING TACTICS UNDER CONDITIONS OF SCARCITY IN MASHIMONI	158
4.5. Youth groups and their impact on the built environment	158
4.5.1 Primary and secondary objectives	161
4.5.2 Resources (elements that can be people, objects or activities)	162
4.5.3 Sites of intervention	164
4.5.4 Translocal and transcalar analysis of the tactics: transformative, reactive or revolving triggers?	167
4.5.5 Translocal and transcalar analysis of the tactics: key barriers	169
4.5.6 Initial lessons for the built environment: what worked, what didn't, how it can be improved and/or scaled-up?	170
4.6 Individual stories of creativity and entrepreneurship: Ndasha	171
4.6.1 Interventions for adequate housing	172
4.6.2 Interventions for adequate toilet facilities for his wife and neighbours	173
4.6.3 Sites of intervention	174
4.6.4 Ndasha's interventions on housing: Translocal and transcalar analysis of the tactics as transformative, reactive or revolving triggers	177
4.6.5 Translocal and transcalar analysis of the tactics: key barriers	177
4.6.6 Ndasha's interventions on toilets: Translocal and transcalar analysis of the tactics as transformative, reactive or revolving triggers	178
4.6.7 Translocal and transcalar analysis of the tactics: key barriers	178
4.7 Large-scale savings groups and their impact on the built environment	179
4.7.1 Primary and secondary objectives	179
4.7.2 Resources (elements that can be people, objects or activities)	180
4.7.3 Translocal and transcalar analysis of the tactics as transformative, reactive or revolving triggers	181
4.7.4 Translocal and transcalar analysis of the tactics: key barriers	182
4.8 Conclusion: What Mashimoni revealed from the relationship between scarcity and creativity in the built environment?	183
DECONSTRUCTING SOCIO-SPATIAL DYNAMICS OF SCARCITY IN ATUCUCHO, QUITO	184
PART I DECONSTRUCTING SOCIO-SPATIAL DYNAMICS OF SCARCITY IN THE BUILT ENVIRONMENT OF ATUCUCHO	184
5.1 Consolidation of informal settlements in Quito	184
5.1.1 How and why informal settlements emerged?	184
5.1.2 Approaches to/against informal settlements	186
5.2 An introduction to Atucucho and its key moments of scarcity	187
5.2.1 Emergence and consolidation	188
5.2.2 A retrospective account of scarcity: A look outwards, location and relation to its surroundings	188
5.3 Socio-spatial dynamics of scarcity in Atucucho	192
5.3.1 Lack of adequate housing and land	192

5.3.2 Lack of basic services and community facilities	198
5.4 Findings from everyday and constructed scarcity in Atucucho	202
5.4.1 Constitution of scarcity in the built environment in Atucucho: discursive, distributive and socio-material	202
PART II - DECONSTRUCTING EMERGING TACTICS UNDER CONDITIONS OF SCARCITY IN ATUCUCHO	203
5.5. Consolidation of basic services: Community consolidation of water infrastructure (Junta de Agua) in Atucucho	204
5.5.1 Primary and secondary objectives	206
5.5.2 Resources (elements)	206
5.5.3 sites of intervention	207
5.5.4 Translocal and transcalar analysis of the tactics: transformative, reactive or revolving triggers	209
5.5.5 Translocal and transcalar analysis of the tactics: key barriers	211
5.6. Consolidation of community services: spatial tactics for child care centres in Atucucho	211
5.6.1 Primary and secondary objectives	214
5.6.2 Resources (elements)	214
5.6.3 Sites of intervention	214
5.6.4 Translocal and transcalar analysis of the tactics: transformative, reactive or revolving triggers	217
5.6.5 Translocal and transcalar analysis of the tactics: key barriers	218
5.7. Consolidation of housing: collective and individual strategies	218
5.7.1 Resources (elements)	219
5.7.2 Transformative tactics as creativity transformative, reactive or revolving triggers	224
5.7.3 Translocal and transcalar analysis of the tactics: key barriers	225
5.8 Consolidation of Saving Groups: The Community Bank of Atucucho	225
5.8.1 Primary and secondary objectives	228
5.8.2 Resources (elements)	228
5.9 Acquiring land tenure: Community organisation and the Neighbourhood Government of Atucucho	229
5.10 Conclusion: What Atucucho revealed from the relationship between scarcity and creativity in the built environment?	234
DISCUSSION : THEORETICAL AND PRACTICAL IMPLICATIONS	235
6.1. The construction of scarcity in informal settlements	235
6.1.1 Exploring Scarcity as constructed	235
6.1.2 An assemblage approach to the study of scarcity and creativity: a discussion on methodology	243
6.2. Scarcity, emerging tactics and socio-spatial change: practical and theoretical lessons	245
6.2.1 Scarcity, emerging tactics and socio-spatial change	245
6.2.2 Lessons for policy makers	246

6.2.3 Lessons for urban dwellers	247
6.2.4 Lessons for built environment practitioners	247
6.3. Relevance and limitations of this study and research areas to develop further	248
6.3.1 Summary of contributions to knowledge	248
6.3.2 Limitations of the study	249
6.3.3 Research areas to develop further	250
REFERENCES	251

ASF-UK	Architecture Sans Frontières UK
AWSB	Athi Water Services Board
BCA	Banco Comunitario de Atucucho (Community bank of Atucucho)
CBD	Central Business District
CC	Children Centres in Atucucho
CODI	Community Organisations Development Institute
COOTAD	Código Orgánico de Organización Territorial (Organic code of territorial organisation)
CSOs	Community-based organisations
GBA	Gobierno Barrial de Atucucho (Neighbourhood government of Atucucho)
GOK	Government of Kenya
IC	Improvement Committee of Atucucho
KENSUP	Kenya Slum-Upgrading Programme
KES	Kenyan shillings (currency)
KISIP	Kenyan Informal Settlements Improvement Project
MIC	Moneda Interna Comunitaria (Internal communal currency)
MIES	Ministerio de Inclusión Económica y Social
MPHS	Ministry of Public Health and Sanitation
MUST	Muungano Support Trust
NCC	Nairobi City Council
NCWSC	Nairobi City Water and Sewerage Company
NEMA	National Environment Management Authority
NESH	Environmental Sanitation and Hygiene Policy
NGOs	Non-governmental organisations
SCIBE	Scarcity and creativity in the built environment
ST	Structure owner
UERB	Unidad especial 'Regula tu Barrio' (Special unit 'Regularise your Settlement')
UNFPA	United Nations Population Fund
UN-Habitat	United Nations Human Settlements Programme
YG	Youth groups

Buen Vivir or 'good living'. Buen Vivir, as used in Ecuador, is a constitutional principle based on the 'Sumak Kawsay', an indigenous vision of the world that is centred in human beings living in harmony with themselves their communities and the natural environment. In Ecuador, Buen Vivir initiatives are led by principles of collective well-being and solidarity economy, and have been introduced in the national constitution and the national development plan.

Junta de Agua. Junta de Agua means water board, or water committee. It is a community organisation in charge of managing the provision of a community-led water system, including its logistical and financial arrangements.

Mediagua. Mediagua is a common name given in Ecuador to housing structures of a temporary nature, built over-night for the purpose of occupying a plot, or for emergencies reasons like natural or man-made disasters.

Minga. Mingas are a pre-Columbian tradition commonly implemented in the Andean countries. It consists of collective efforts and voluntary work (i.e. labour, savings, contributions) for communal or reciprocal benefits.

Minga card. Minga cards are personal cards that record and control resident's participation in mingas and community meetings. Attendance is recorded through stamps and signatures.

Sierra. Sierra is used here to refer to the settled areas of Ecuador that are located at higher altitude and within the mountain range and volcanoes typical of the central part of the country. It includes the metropolitan area of Quito and its surroundings.

CHAPTER I

Fig. 1.1 Diagram illustrating the research design, processes and outcomes

CHAPTER II

Fig. 2.1 Diverse activities and uses of the main roads and corridors in Mashimoni, one of the case studies of this research

Fig. 2.2 Diagram illustrating the theoretical framework based on an assemblage approach to scarcity and creativity

CHAPTER III

Fig. 3.1 Residents of Mashimoni discussing their photographs during the second stage of the photo-voice exercise

Fig. 3.2 Selected participants of the photo-voice exercise in Mashimoni, Kenya and their geographical location within the village according to clusters.

Fig. 3.3 Residents of Atucucho telling the stories of the consolidation of their neighbourhood and their own houses

Fig. 3.4 Selected participants for the transect walks and in-depth interviews in Atucucho, Ecuador and their geographical location within the settlement according to sectors

Fig. 3.5 Lack of adequate washing spaces - sites where this condition is experienced and personal narratives

Fig. 3.6 Step 1: Identifying the sites of scarcity based on everyday narratives

Fig. 3.7 Example of how experienced conditions of scarcity are analysed in each site

Fig. 3.8 Example of the assemblage of experienced scarcity: Effects of scarcity across sites based on case study I (see section 4.3.3 Lack of adequate toilet facilities)

Fig. 3.9 From experienced to constructed scarcity: Putting the assemblage together by organising relations, experienced conditions and primary and secondary data across different scales

Fig. 3.10 Constructed scarcity Layer 1: Analysis of issues in the translocal and transcalar diagram according to their material, contextual, political, social, personal and temporal nature.

Fig. 3.11 Constructed scarcity Layer 2: Analysis of key actors, sites and activities in the translocal and transcalar diagram

Fig. 3.12 Layer 3 Scarcity vs tactics: Deconstructing emerging tactics under conditions of scarcity

Fig. 3.13 Conceptual framework vs Assemblage and diagrammatic approach | Constructed and Transcalar scarcity

CHAPTER IV

Fig. 4.1 Plan of Nairobi Central Business District and Nairobi Eastlands, including Mathare Valley and Mashimoni Village (Constructed by the author).

Fig. 4.2 Schematic section of Mashimoni showing the topography of the village

Fig. 4.3 A chart showing average monthly expenditures vs monthly income for a household of tenants in Mashimoni

Fig. 4.4 An overview of the sewerage condition across Mashimoni

Fig. 4.5 Plan view of open drainage in Mashimoni, including main sewage line and most vulnerable clusters (constructed with information from Map Mathare and fieldwork, 2011)

Fig. 4.6 Risk in everyday household and recreational activities - sites where this condition is experienced and personal narratives

Fig. 4.7 Difficulty in maintenance of circulation areas - sites where this condition is experienced and personal narratives

Fig. 4.8 Discomfort and shame - sites where this condition is experienced and personal narratives

Fig. 4.9 Low productivity and discouragement of collective activities - sites where this condition is experienced and personal narratives

Fig. 4.10 Lack of adequate sewerage | Effects across sites of experienced scarcity

Fig. 4.11 Lack of adequate sewerage | Constructed scarcity Layer 1: Analysis of issues in the translocal and transcalar diagram according to their material, contextual, political, social, personal and temporal nature

Fig. 4.12 Lack of adequate sewerage | Constructed scarcity Layer 2: Analysis of key actors, sites and activities in the translocal and transcalar diagram

Fig. 4.13 Lack of adequate sewerage | Example of key contextual and material findings extracted from main diagram

Fig. 4.14 An overview of the housing conditions across Mashimoni

Fig. 4.15 Risk associated to ventilation, pollution, fire, collapse and flooding - sites where this condition is experienced and personal narratives

Fig. 4.16 Rigidity of space - sites where this condition is experienced and personal narratives

Fig. 4.17 Constant threat to tenants and their neighbours (disruption of networks and social ties) - sites where this condition is experienced and personal narratives

Fig. 4.18 Lack of adequate and flexible housing | Effects across sites of experienced scarcity

Fig. 4.19 Lack of adequate and flexible housing | Constructed scarcity Layer 1: Analysis of issues in the translocal and transcalar diagram according to their material, contextual, political, social, personal and temporal nature

Fig. 4.20 Lack of adequate and flexible housing | Constructed scarcity Layer 2: Analysis of key actors, sites and activities in the translocal and transcalar diagram

Fig. 4.21 An overview of the toilet conditions across Mashimoni

Fig. 4.22 Poor maintenance and management of communal toilet facilities - sites where this condition is experienced and personal narratives

Fig. 4.23 Poor construction and design of communal toilet facilities - sites where this condition is experienced and personal narratives

Fig. 4.24 Risk in recreational and household activities - sites where this condition is experienced and personal narratives

Fig. 4.25 Lack of privacy and dignity - sites where this condition is experienced and personal narratives

Fig. 4.26 Lack of adequate toilet facilities | Effects across sites of experienced scarcity

Fig. 4.27 Lack of adequate toilet facilities | Constructed scarcity Layer 1: Analysis of issues in the translocal and transcalar diagram according to their material, contextual, political, social, personal and temporal nature.

Fig. 4.28 Lack of adequate toilet facilities | Constructed scarcity Layer 2: Analysis of key actors, sites and activities in the translocal and transcalar diagram

Fig. 4.29 An overview of the waste management conditions across Mashimoni

Fig. 4.30 Continuous emergence of temporary dumpsites - sites where this condition is experienced and personal narratives

Fig. 4.31 Difficulty in maintenance or circulation areas - sites where this condition is experienced and personal narratives

Fig. 4.32 Lack of adequate waste management | Effects across sites of experienced scarcity

Fig. 4.33 Lack of adequate waste management | Constructed scarcity Layer 1: Analysis of issues in the translocal and transcalar diagram according to their material, contextual, political, social, personal and temporal nature

Fig. 4.34 Lack of adequate waste management | Constructed scarcity Layer 2: Analysis of key actors, sites and activities in the translocal and transcalar diagram

Fig. 4.35 Overview of youth group activities and interventions

Fig. 4.36 Youth groups active in Mashimoni and their various interventions

Fig. 4.37 Youth groups and their interventions in the built environment | Interventions juxtaposed with the constructed scarcity "Lack of adequate waste management"

Fig. 4.38 Youth groups and their interventions in the built environment | Interventions juxtaposed with the constructed scarcity "Lack of adequate toilet facilities"

Fig. 4.39 Individual stories of creativity and entrepreneurship: Ndasha and his interventions in Mashimoni

Fig. 4.40 Ndasha' interventions in the built environment | Interventions juxtaposed with the constructed scarcity "Lack of adequate and flexible housing"

Fig. 4.41 Ndasha' interventions in the built environment | Interventions juxtaposed with the constructed scarcity "Lack of adequate toilet facilities"

CHAPTER V

Fig.5.1 Plan view of the six sectors of Atucucho

Fig.5.2 Overview of the six sectors of Atucucho

Fig.5.3 Plan view and images of the most vulnerable sectors of Atucucho

Fig. 5.4 Overview of mediaguas and housing at the different stages of consolidation

Fig. 5.5 Lack of adequate housing and land | Constructed scarcity Layer 1: Analysis of issues in the translocal and transcalar diagram according to their material, contextual, political, social, personal and temporal nature

Fig. 5.6 Lack of access to basic services | Constructed scarcity Layer 1: Analysis of issues in the translocal and transcalar diagram according to their material, contextual, political, social, personal and temporal nature

Fig. 5.7 José Delgado, the Aguatero of Atucucho for 15 years, in front of the former Junta de Agua, where the tanks and main water system used to operate

Fig. 5.8 .An annual ID card confirming the participation of the resident in the Junta de Agua, dated from 1993

Fig. 5.9 A receipt recording the financial contribution of the resident for maintenance materials, dated from 1996

Fig. 5.10 The Junta de Agua and its impact in the built environment | Interventions juxtaposed with the constructed scarcity "Lack of access to basic services"

Fig. 5. 11 Images from Digna's house and its current layout

Fig. 5.12 How Digna's house changed under the contract

Fig. 5.13 The child care centres and their impact in the built environment | Interventions juxtaposed with the constructed scarcity "Lack of access to basic services"

Fig. 5.14 The child care centres and their impact in the built environment | Interventions juxtaposed with the constructed scarcity "Lack of access to housing and land"

Fig. 5.15 Individual stories of upgrading in Atucucho

Fig. 5.16 Individual housing strategies | Interventions juxtaposed with the constructed scarcity "Lack of adequate housing and land"

Fig. 5.17 Collective housing strategies | Interventions juxtaposed with the constructed scarcity "Lack of adequate housing and land"

Fig. 5. 18 Images from the Community Bank of Atucucho

CHAPTER III

Table 3.1. Step 2 | Understanding the sites - Identifying the elements in the dwelling site

Table 3.2. Step 2 | Understanding the sites - Identifying the elements in the corridors

Table 3.3. Step 2 | Understanding the sites - Identifying the elements in the vacant spaces

Table 3.4. Step 2 | Understanding the sites - Analysing relations between element at the housing site

Table 3.5 Step 2 | Understanding the sites - Analysing relations between element in the corridors

Table 3.5 Step 2 | Understanding the sites - Analysing relations between element in vacant land

CHAPTER IV

Table 4.1 Summary of condition A | Risk in everyday household and recreational activities

Table 4.2 Summary of condition B | Difficulty in maintenance of corridors

Table 4.3 Summary of condition C | Discomfort and shame

Table 4.4 Summary of condition D | Low productivity and discouragement of collective activities

Table 4.5 Summary of condition A | Risk associated to ventilation, pollution, fire, collapse and flooding

Table 4.6 Summary of condition B | Rigidity of space

Table 4.7 Summary of condition C | Constant threat (disruption of networks and social ties)

Table 4.8 Summary of condition A | Poor maintenance and management of communal toilet facilities

Table 4.9 Summary of condition B | Poor construction and design of communal toilet facilities

Table 4.10 Summary of condition C | Risk in recreational and household activities

Table 4.11 Summary of condition D | Lack of privacy and dignity

CHAPTER V

Table 5.1 Dwellers and their role in the inception and upgrading of earlier occupations (1970s-1980s)



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1.1 BACKGROUND (WHY SCARCITY AND WHY IN THE BUILT ENVIRONMENT)

This research stems from concerns with pressing issues affecting the built environment in contemporary cities of both the global North and South, including economic crises, accelerated rates of urbanisation and depletion of resources, all of which are posing increasing challenges to all those living in and producing the built environment.

In developed countries, austerity measures are progressively becoming part of development and prosperity discourses as a way to deal with the limitations of 'not having enough'. In turn, these measure are directly shaping the policies and planning strategies governing housing and service provision. In the global south - the geographical focus of this research- scarcity in cities has been a prevalent constraint, commonly conceived in the form of material deprivation, and the limited financial and institutional capacity of governments to cope with rapid urbanisation and the plethora of political and socio-economic challenges arising from it. In both cases, when it comes to the built environment, scarcity is mainly conceived as a material condition - as an actual lack of resource - with little understanding of what it is, how it comes to be and how it shapes the built environment in urban settings.

Within this landscape of constant limitations, no other urban phenomena has been associated more prominently with scarcity than informal settlements¹, most commonly referred to as 'slums'. Informal settlements are usually used as the 'image' of poverty, and in some cases, they seem to portray the failure of the project of the city. While they continually seem to inspire fascination and curiosity for their resourcefulness and survival strategies, they still are largely regarded by authorities as obstacles to progress, and with this, they overlook any transformative potential or constructive aspects that the informal might bring to the wider urban discourse and practice.

¹ 1 For the purpose of this research, the term informal settlement will be congruent with UN-HABITAT's definition of a slum, meaning an urban area that lacks one or more of the following: 1) Durable housing of a permanent nature that protects against extreme climate conditions, 2) Sufficient living space which means not more than three people sharing the same room, 3) Easy access to safe water in sufficient amounts at an affordable price, 4) Access to adequate sanitation in the form of a private or public toilet shared by a reasonable number of people and 5) Security of tenure that prevents forced evictions.

Perhaps, this is related to the fact that, in the majority of the cases, the definition of what the 'problem' is, what is 'lacking' and how it should be addressed, seems to be mostly imposed by those in charge and with power to produce solutions and give answers, meaning, the authorities and to some extent the professional and academic bodies with the credibility to influence policies and discourses. Interventions in informal settlements have largely been influenced by the way they are defined in the first place. In countries like India and Kenya approaches have varied from eviction and tabula rasa redevelopment, in-situ upgrading through public-private partnership, and most recently through partnerships between, local authorities, civil society organisations and mobilised communities. The inclusion of communities as partners in the development of these areas, meant that at least a slight redefinition of the 'problem' was made, and the resulting interventions started using the local skills and the residents' inherent knowledge on the context. But all these changes seem to be more of a pragmatic nature, with little influence on the way all sectors of society conceive and act on the city. Have we really reached an understanding of urban informality that manages to draw essential lessons for a better city building and identify key obstacles that impede real prosperity, without falling into romantic or criminalising views of this mode of urbanisation? Has there been a fundamental change in the way we conceive cities, our relationship with nature and processes of production of built environment?

In the same line, this thesis is part of a collaborative research project 'Scarcity and Creativity in the Built Environment' SCIBE². This project understands scarcity as an opportunity for "inspiration and a context for constructive and transformative action" (Till, 2012). This opportunity arises from the complexity embedded in scarcity, if conceived as not only a limitation of resources but a constructed condition, a product of how resources are managed and allocated. It encourages you then, to dissect its constitution and find other ways to deal with it.

Furthermore, the project puts emphasis on the opportunities of 'thinking through scarcity' in the design process, as a concept to explore a spatial or environmental situation through a different lens, one that reveals its mechanisms of production (Goodbun, 2013:13).

² SCIBE explores the relationship between scarcity and creativity in the context of the built environment by investigating how conditions of scarcity might affect the creativity of the different actors involved in the production of architecture and urban design, and how design-led actions might improve the built environment in the future. The research is based on the analysis of processes in four European cities: London, Oslo, Reykjavik, and Vienna.

Based on this, this research aims to contribute to knowledge by applying the SCIBE premise of scarcity as *heuristic device* and as an *opportunity for transformative action*, into the context of informal settlements. The following section will address the hypothesis and research questions guiding this research.

1.2 STUDY AREA (HYPOTHESIS AND RESEARCH QUESTIONS)

The research begins with the premise that the examination of issues of scarcity in the production of the built environment can inform new ways of thinking and acting around cities and space. It investigates whether informal settlements, characterised as they are by their spontaneous and flexible nature and a general lack of external professional and technological inputs, constitute a scenario with unique characteristics where the construction of scarcity and its influence on creativity can be explored in a new light.

In line with this, the research is guided by the following research questions:

- a. How is scarcity in the built environment constructed in the context of informal settlements in the Global South?
- b. What kind of creative tactics emerge under conditions of scarcity by those producing the built environment? -
- c. What is the relation between scarcity, the emerging tactics and socio-spatial change³? What theoretical and practical lessons can be drawn from it?

1.3 LITERATURE REVIEW

The first two research questions, concerning the construction of scarcity in informal settlements and the deployment of creativity under conditions scarcity, have been addressed in three ways. Firstly, through an extensive literature review in the fields of architecture, urban planning, sociology, geography and environmental disciplines, that informed the overall research design, including the planning and implementation of the fieldwork. Secondly, through an 11-month ethnographic field

³ The term socio-spatial makes reference to the dialectic relationship between people and places: People are constantly modifying and reshaping places, and places are constantly coping with change and influencing their inhabitants (Knox 2005: 3).

study in the informal settlements of Mathare Valley, in Nairobi, Kenya and Atucucho, in Quito, Ecuador. And thirdly, through the application of an assemblage and diagrammatical approach to the analysis of primary and secondary data. The following two sections will summarise the exploration of theory and approaches to scarcity, creativity and informal settlements that informed the development of rest of this thesis.

1.3.1 THEORETICAL UNDERPINNINGS | SCARCITY - FROM MATERIAL ACCOUNTS TO SOCIO-SPATIAL REALITIES

The research initially drew on a literature review that examined how scarcity has been defined and conceptualised across different disciplines. This review intended to start building an approach to scarcity in the built environment by contextualising this concept in urban and architectural discourses, particularly regarding urban informality, and subsequently drawing key aspects that connect scarcity to socio-spatial processes.

(a) What do you mean by Scarcity? Overview of theoretical approaches

This is a question I get asked more often than expected whenever I talk about my research. Most people associate scarcity with ‘not having enough’ of something, most likely material, but very few use it in their common lexicon. It is in fact a word that, with the exception of academia, is mostly used when referring to environmental issues (natural resources becoming scarce). Hence, the initial literature review started by exploring how scarcity has been defined and conceptualised in academic discourses, through which it soon became apparent that a wider, more nuanced, approach to the word and its meanings would be necessary.

The concept of scarcity was almost exclusively associated with neoclassic economics, with Robbins defining economic science as “the forms assumed by human behaviour in disposing of scarce means” (Robbins, 1932:15 quoted in Xenos, 1987:235). In an over-simplistic manner, it could be said that scarcity within this field is shaped by the interplay between needs and resources, being this interplay the processes that govern its production. Scarcity then revolves around abstract or material needs such as goods and commodities which in turn can be substituted through the interplay of economic exchange and the optimisation of goods under constraints (Baumgartner et al., 2006). According to this view scarcity is relative, solely material, inherent to human nature and integral to economic relations of production. Therefore scarcity is necessary and should only be mitigated, not

eradicated, through substitution and exponential economic growth (Homer-Dixon, 1995) therefore stressing the power of men and capital in transforming nature and its resources (Harvey, 1996).

Within environmental discourses, Malthus pioneered a highly influential approach to scarcity, that was rather straightforward yet highly reductive. Scarcity was a consequence of the imbalance between nature's resources (in this case food) and population growth, envisioning population control via preventive checks (reflection on actions and morals) and positive checks (war, severe poverty, famine) as the only solution (Malthus, 1976). Neo-Malthusians expanded this reductive notion into considering a wider range of underlying conditions i.e. industrialisation, exponential growth and consumption suggesting social and technological adaptation as the way to tackle the imminent scarcity of resources (Meadows et al., 1972).

These stances considered scarcity a material condition, putting forward solutions of an exogenous kind, separating nature from society and remaining oblivious to any difference arising from socio-cultural aspects embedded in any context, whether rural or urban. Subsequently, this way of conceiving scarcity inherently pervades a sense of exclusivity when sectors of society or even entire countries and regions are unable to adapt or enforce such solutions.

On the other hand, these stances have been contested, particularly within the field of sociology, encouraging a transition from a naturalistic view to a socio-cultural theory of scarcity, where scarcity is directly associated with social change (Stanley, 1968). Scarcity therefore exists in relation to the collective behaviour, the norms, the rules and the institutions that govern the social order (see Stanley, 1968; De Gregori, 1987) thus indicating a relationship between environmental mechanisms and socio-cultural modernism (Daoud, 2010). Scarcity then, makes the transition from being purely associated with commodities and material conditions, to being in direct relation to subjective aspects embedded in culture and arising from societal processes. Nonetheless, although this standpoint brings the concept of scarcity closer to the complexity of human interaction and behaviour, it also tends to rely on the subjectivity of localism, falling short of addressing structural issues of inequality, particularly if faced against the intricacy of current urban settings.

In contrast, Turner and Rojek, expand sociology's role on the study of scarcity, by arguing that the relation established between conditions of scarcity and collective intent is rooted in resource distribution and citizenship:

"Sociology as a discipline can function effectively as the scientific study of society when it is concerned to probe the contradictions, ambiguities and tensions between scarcity and solidarity, that is between patterns of inequality and relations of cooperation." (Turner and Rojek, 2001:8)

On the one hand, this argument recognises the study of scarcity as crucial to understand social action (i.e. practices of solidarity and social connectivity) and on the other hand, by linking it to the dynamics behind resource allocation, it inherently establishes a relationship between the social, economic and political realms. This focus on social action stemming from the relationship between scarcity and solidarity, also contributes to the debate by identifying values and norms inherent in the choices and actions taken within conditions of scarcity (Parsons, 1937, as in Turner & Rojek 2001). How can we understand what acts as an incentive for mobilisation and social action and how it relates to conditions of scarcity?

More recently, the work of political ecologists has expanded the debate on scarcity by illustrating the relationship between macro systems of allocation and context-specific conditions of insufficiency. Furthermore, political ecology has shed light on the interplay between environmental conditions and political struggles (Swyngedouw, 2004); it has introduced the discursive nature of resources (Mehta, 2010; see also Mehta, 2001) and it has shed light on the particularities embedded in difference, social movements and the construction of knowledge (Escobar, 2006). In the same line, Political Ecology has been recognised "as an important and influential theoretical framework for environmental justice studies" (Holifield, 2009:638) and in the case of scarcity and inequality, it has been used to generate valuable empirical research (See Swyngedouw 2004, Mehta, 2001, 2010; Escobar 2006).

Through the review of this body of work on issues of scarcity, it became apparent how by increasing our understanding on this condition, a critical lens starts to emerge, eliciting crucial questions that can clarify the workings of specific settings and conditions of scarcity.

Three key, interwoven lessons emerged from this initial review, specifically related to the first research question:

- Firstly, the socio-material nature of scarcity is introduced, challenging the common perception that scarcity revolves solely around the materiality of goods and commodities. This acknowledgement of societal processes, including how scarcity is perceived and how groups come together under extreme conditions and with specific interests, is crucial to understand how resources are used and managed.
- Secondly, the discursive nature of scarcity is introduced, again exemplifying an [im]material aspect of this condition and illustrating how knowledge and power are intrinsically related, on the one hand, to the management and distribution of resources, and on the other, to the way responses are formulated to mitigate or get rid of scarcity.
- Thirdly, it touches upon issues of distributive justice. It begs the question, who's scarcity? Whether it stems from the reductive and exclusionary Malthusian perspective, or from the structuralist point of view of political ecology, scarcity is deeply related to how resources are distributed and controlled and therefore expands to the economic and political realms.

(b) Scarcity of what and for whom? Resources and theories of justice

The distributive nature of scarcity was briefly explored through the previous sections. Several theories of justice are of relevance to this research, particularly theories of the just city, environmental justice and spatial justice. Theories of the just city have typically addressed issues of maldistribution, as a key process through which particular groups or sectors of society become marginalised and affected in a higher degree than others. As Fanstein (2010) points out, mainstream approaches to the 'just city' have been focused on the planning apparatus and government practices, from how public investment is conceived and implemented, to how policies are formulated. One example of how this is translated into a principle that can guide interventions in a city, is neoliberalism, as "the doctrine in which market processes result in the efficient allocation of resources and provides incentives that stimulate innovation and economic growth" (Ibid, 2010:8). This constitutes a very pragmatic (or technocratic) approach, focused on governance, in which the quest for achieving justice and equity in a city is marked by solutions that arise from the 'top' (i.e. subsidies), and that very much ignore the

particularities of context and the social complexities present in any urban agglomeration. Many of the planning tools arising from this are very common in government practice, and sometimes are even replicated or borrowed from one strikingly-different context to another, disregarding in the first place, the very nature of the problem they intend to address. This brings into the discussion again, the problems arising from not understanding what the problem is and how it comes to be and using the slogan of justice, equity, sustainability and so on to devise solutions of high visibility and projection but little effect in people's lives. What could a more spatial approach to scarcity contribute to how issues with marginalised areas are conceived and understood, and furthermore how they are addressed?

Water offers one, if not, the most evident example to analyse scarcity and its relationship to maldistribution, flawed policies and unequal power relationships⁴. The Human Development Report 2006, puts a particular emphasis on political and regulatory practices with a crucial role in how scarcity affects specific groups or areas, situating the debate into the realm of 'social and environmental justice'. It brings together several statistics that document extensively how the poorest are paying the highest prices to access water and how many of the policy instruments devised to ameliorate this condition (i.e. subsidies) end up benefiting the well-off instead of those more affected (UNDP, 2006:17, 21). Nonetheless, the report remains, perhaps for practical reasons, broad in its focus and detached from critical engagement with social and physical implications arising from context. In this line, the solutions put forward by the report lie exclusively within the political and institutional realm, in the form of broad guidelines with little practical value for government and institutions, especially those with limited financial and institutional capacities. The report also draws attention to several key conditions that increases the disadvantage of specific groups, mainly wealth and gender, but it does not dwell into social mechanism or strategies emerging from local practices and mobilisation. Despite its contribution to the debate on scarcity, as actors with substantial influence on national and local authorities, the report remains very much top-down in its approach and misses an opportunity in exploring and shedding light into the crucial mechanisms embedded in the social and spatial realms.

⁴ See for example Mehta, 1998; Swyngedouw, 2004

Other approaches to the just city have indeed critiqued this sole emphasis on maldistribution. Iris Young (2002) and Nancy Fraser (1995) contributed to theories of justice, mainly by focusing on the *construction* of the maldistribution in the first place and how and why this affects specific oppressed and marginalised groups. They make reference to how issues of power play an important role and how recognition is key to achieve any kind of justice in the city. This brings the discussion into a different kind of, we could say, 'scarcity' where what is lacking, in parallel to an equitable distribution of resources, is the chance to be acknowledged, to fully express difference and to influence processes that affect their chances to a dignified life in the city. This perhaps goes back to the socio-cultural theories of scarcity, as they also placed emphasis on this interplay of resources and inclusion, although in a more simplified way, linking it to issues of participation (Stanley, 1968:860).

Another approach to justice relevant to this research, is the one based on freedom and capabilities, as developed by Amartya Sen (see Sen, 2009; and Stiglitz, Sen and Fitoussi, 2009, Ch.2 on Quality of Life) and Martha Nussbaum (See Nussbaum and Sen, 1993; and Nussbaum, 2003, 2011). This approach goes beyond the 'lack' of material resources needed to flourish, to consider and examine how capabilities and freedoms to transform the existing resources into a better quality of life are diminished by a variety of socio-economic and political processes: "The focus is not simply on a conception of distribution, or on recognition, for example, but more holistically on the importance of individuals functioning within a base of a minimal distribution of goods, social and political recognition, political participation and other capabilities" (Schlosberg, 2007:34). What allows or precludes individuals transform what they have into valuable and meaningful outcomes, of both social and material nature? This is particularly relevant to contexts where what is lacking may not be material resources but opportunities of social, economic and political nature.

This focus on well-being and prosperity is also tackled in a similar way by economist Tim Jackson. Jackson (2003) makes a case for a more sustainable model of development by re-conceptualising established notions of prosperity. While material possessions may contribute to one's wellbeing these do not necessarily equate to prosperity. "Rather prosperity has to do with our ability to flourish: Physically, psychologically and socially. Beyond mere subsistence, prosperity hangs crucially on our ability to participate meaningfully in the life of society" (Jackson, 2003:143). He continues to support his argument, through the work of the psychologist Tim Kasser who identified through statistical means how "self-acceptance, affiliation and sense of belonging" indeed contribute to

wellbeing, therefore increasing the potential to flourish even when material substance becomes scarce (referenced in Jackson, 2003:148). Moreover, this rationale is strongly empirically supported by Wilkinson and Pickett's (2009) "The Spirit Level", a compendium of cases and statistics that illustrate how economic growth is not necessarily equivalent to wellbeing, specifically in polarised and unequal societies where exclusionary practices (at different levels) are the norm rather than exception.

This initial review revealed the socio material, discursive and distributive nature of scarcity. Nonetheless, it also elicit an almost complete absence of the spatial connotations of scarcity, crucial for the understanding of this condition within human settlements. With the purpose to start 'spatialising' the concept, the following section will address how scarcity has been examined, directly and/or indirectly within urban and architectural discourses, with a particular focus on informal settlements.

1.3.2 INFORMAL SETTLEMENTS AS TERRITORIES OF SCARCITY

The hypothesis driving this research deliberately positions informal settlements as scenarios where the study of the conditions of scarcity in the built environment can cast light on socio-spatial change and eventually elicit alternative approaches to thinking and acting on urban settings.

With more than 50 percent of the population living in cities, it is a well-known fact we are living in a urban world (UNFPA, 2007). Cities have become territories of wealth, culture, conflict and, as exemplified by the number of people living in urban slums, the locus of acute social and environmental challenges (UN-Habitat, 2003; Davis, 2005). If scarcity has been considered, based on the previous section, a socio-material condition related to the use, management and control of material and immaterial resources, it seems only natural to study it in contexts where it is more acutely experienced. Nonetheless, the following literature review will expand this motivation by focusing on the 'why' and the 'how'. Firstly, it will explore what makes informal settlements a unique scenario for the study of scarcity, and its potential to shed light on new ways of approaching socio-spatial change. Secondly, it will draw findings of how to approach the study of informal settlements, reviewing different literature on architectural and planning approaches to informality.

The term 'informal' was originally coined in Ghana by anthropologist Keith Hart, when undertaking research on urban labour markets in Accra (Hart, 1973). Since then, a series of dualistic views emerged across different disciplines, positioning the informal as a state of exception with mostly 'negative' characteristics (i.e. illegal, unplanned etc.). It is not surprising, that within the realm of urban development and state intervention, this dualistic view elicited policies that mostly criminalised the informal, consequently advocating its eradication in the form of evictions and 'tabula-rasa' redevelopment.

Likewise, within the discourses of architecture and urbanism, informal settlements were also initially conceptualised as 'states of exception', as islands of deprivation and uncertainty. Nevertheless, and perhaps in response to criminalising policies and state interventions, these discourses also sought to expand this reductive characterisation by examining these areas as hubs of resourcefulness and constant transformation. For example, the 1960s and 70s marked the initial efforts to recognise and value people's agency in making good use of resources and transforming their own built environment, while challenging at the same time the principles of the established planning and architectural order at the time (Turner, 1972,1976; Rudofsky,1964). Furthermore, this period also witnessed an increasing documentation of everyday ingenuity when dealing with severe social, economic and political constraints, with the aim to contest the stigma of marginality vested in those living in informality (Pearlman, 1976; Peattie, 1968). Nevertheless, perspectives on the relationship between informality and ingenuity remained mostly localised, unconnected to the macro-structures that create the constraints in the first place and in some cases critiqued of perpetuating the modern model (and dualistic view) of development and emerging policies (Burgess, 1977). Hence, although spatial conditions of scarcity were inherently acknowledged within these discourses, they fell short on critically examining its nature, emergence and development.

More recently, architectural research has increasingly become preoccupied with understanding issues that are closely related to scarcity in the built environment, particularly urban poverty, inequality and lack of affordable housing in informal settlements. For example, the work of Gough and Kellett (Gough and Kellett, 2001; Kellett, 2005) has illustrated how in many of these settlements, livelihood strategies are closely linked to the use and transformation of dwelling environments, thus challenging the normative separation of 'home' and 'work' spaces that characterises many housing provision projects. Similarly, Teddy Cruz emphasises the need "to transform existing paradigms of

housing, infrastructure and density” (Cruz, 2011:111). His work focuses on the neighbourhood as an ‘urban laboratory’ with potential to inform global processes (Cruz, 2004-2005; 2008) and relies on the mapping of a variety of production processes and conditions of both abundance and scarcity, in order to inform the design of ‘new institutional protocols’ (Cruz, 2011).

Further architectural research on informal settlements has explored the particularity of spatial production within these contexts and how it puts into question the normative processes of architecture: “If they had access to more advanced means; they would probably not act to the same artistic logic, with its openness and its creation of singular events and singular values, because all the advanced architectural means we have today were forged by and for heteronymous production” (Baltazar and Kapp, 2007:10; See also Kapp et al. 2008). Similarly, Dovey and King (2011:12) argue that “the prospects of a sustainable in-situ development depend on the better understanding of the morphologies of informal settlements”. The focus on deconstructing how these urban settings emerge and develop, “driven by the imperatives of poverty and the slow accumulation of scarce resources” (Dovey and King, 2011:13) and identify morphological typologies to inform a new language of informality in this context.

Although current architectural research that addresses scarcity whether directly or indirectly, is limited, the previous examples bring forth the following key lessons for this thesis:

- Firstly, they illustrate the relationship between spatial patterns of production and social and economic processes related to scarcity, particularly socio-economic inequality and poverty.
- Secondly, they demonstrate how informal settlements have unique characteristics that, on the one hand, govern spatial production, and on the other influence the emergence of self-organisation and creative coping strategies from a non-expert perspective, which in turn can offer lessons for the role of professionals in transforming the built environment.

These debates are extensive, and largely go beyond the scope of this thesis. However, the following discussions remain central to this research, as they complement and in some cases, critically challenge many of the current architectural approaches to urban informality.

Within urban planning theory, informality has also moved from a state of marginality to a significant source of knowledge, an “idiom of urbanisation” (Roy, 2009a:9) capable of informing, scrutinising and reconfiguring the theory and practice of both architecture and planning and arguing for its relevance and implications for both south and north of the globe (Pugh, 2000; Roy, 2009a). In her work, Roy (2009b), challenges the common binary positions (formal vs. informal) that define informal settlements as states of exception or isolated areas. She argues that within these sites, lines between the ‘formal’ and the ‘informal’ are commonly blurred. Informal settlements are indeed constituted by a unique series of arrangements, but these are intrinsically connected with socio-economic processes that go beyond its own physical limits. She also argues that this binary is partly produced by the state, particularly by planning, and consequently it can, and is often used strategically by both (Roy, 2005).

In a similar line, Simone and Abouhane (2005) through their work on African cities, also make reference to informal settlements as a particular logic of habitation with its own political economy, which in most cases remains incompatible with the institutional framework guiding housing provision in the city. Moreover, their work draws extensive linkages between this distinct logic and city-wide and historical processes that have slowly shaped cities in Africa, particularly in relation to long-term state absenteeism, the consequences of colonialism and the emphasis placed on land as a precious and highly contested resource.

More importantly, Simone and Abouhane’s work has also documented processes of resourcefulness within informal settlements, with the aim to “valorise urban Africa’s own agency, its own constructive powers”. They argue that within these scenarios, “the critical emphasis is on what residents actually do in order to enlarge their spaces of operation or, conversely, to demarcate territories of habitation that are liveable, and where the negative impacts generated by the undermining of local livelihoods and by global economic processes might be partially generated” (Simone and Abouhane, 2005:2).

On the other hand, Varley offers a more specific critique of architectural approaches to urban informality. She argues that “a re-engagement with informality as architecture may have been overdue, but it should be as an ally rather than an alternative to ethnographic inquiry” (Varley, 2010:8). With this critique she warns of the perils of aestheticising conditions and reinforcing

stereotypes within informal settlements and the type of policies this “detachment’ from local experiences and perceptions can elicit:

“Is there no danger that celebration of the precarious, improvised, ephemeral, nature of informal settlements, or of their resemblance to rhizomes, with the ability to grow again (elsewhere) if disrupted, could re-legitimise hostile responses by city authorities—even eradication? Even if eviction is kept off the agenda, what kinds of intervention are encouraged by the visions of informality currently in vogue?” (Varley, 2010:8)

This body of work offers the following key points with value for the conceptual framework and the methodological approach:

- Firstly, it reinstates the position of informal settlements as unique scenarios by illustrating how acute conditions related to scarcity give birth to a plethora of particular phenomena shaping the territory, social relationships and processes, from day to day transactions to more validated and ingrained proceedings.
- Secondly, it reinforces the need to enrich literature in informal settlements based on the resident’s own experiences and perceptions.
- Thirdly, although it places the importance on deconstructing local realities, in a similar manner as the socio-cultural theories of scarcity did, it does so by intrinsically connecting it to the project of the city that guides built environment production at different scales.

The initial literature review demonstrated that in order to explore scarcity on informal settlements, the research methodology should provide an insight into everyday life of residents within this context and how scarcity is perceived and experienced by them. Furthermore, it is also critical to eventually expand this focus to how the relevant resources become scarce, how they are managed under constrained conditions and under the alternative set of rules that may govern interactions, transactions and norms within the settlement.

1.3.3 CREATIVITY AND ITS TRANSFORMATIVE QUALITY

This section will review different approaches to social innovation and creative communities in order to understand the circumstances that preclude or foster real change in communities with scarce resources. This section is of particular reference to relationship between scarcity, creativity and socio-spatial change (research question C).

In his work with creative communities and innovation in design, Manzini (2010:3) defines 'creative communities' as "those groups who co-operatively invent, enhance and manage innovative solutions for new ways of living, and do this by recombining things that already exist". Furthermore, he recognises three common denominators that characterise creative communities and that intrinsically support the kind of sustainable change that these communities achieve through social innovation:

Cooperativism and Creativity: The ability and disposition to come together and creatively find and implement solutions with the existing resources.

Challenge to the status quo: This collective intent arises from discontent with the status quo, thus challenging the norms and introducing new ways of doing things.

Crucial opportunities within the context: Previous knowledge, the potential of the existent resources (i.e. services, infrastructure, products) and the presence of fostering, or at least tolerant, social and political environments.

In a similar manner, Jackson (2003) highlights how collective intent and fostering environments pose more chances for social innovations to succeed. Nonetheless, the author also acknowledges the danger of becoming marginalised or obsolete when trying to challenge normative values and structures that are deeply ingrained in societies or political and economic systems. For this reason his argument of flourishing within limits is counter-part to the fundamental establishment of "new structures that provide capabilities for people to flourish and particularly participate fully in the life of society, in less materialistic ways" (Ibid, 2003:153).

Both authors put emphasis on flexible environments that can tolerate and enable 'radical transformation' that goes beyond generic change and transcends and sustains over time. With similar concerns and in response to the changes brought upon by social innovation, Swyngedouw discusses new ways of government innovation that allows the state and institutional apparatus to breakdown and adapt "in order to respond to changing socio-economic and cultural conditions and social demands for enlarged public participation" (Swyngedouw, 2009:63).

Swyngedouw's discourses about the reorganisation of a system in order to make it not only tolerant but also flexible, open and encouraging brings together the elementary need (scarcity) and the claim (creative responses) for an active agency in the production of the built environment along with the innovative forms of governance and institutional arrangements necessary to enable, achieve and sustain transformative change.

In the same line, one example in practice that can elicit some lessons, is the case of Baan Mankong⁵ in Thailand, a nation-wide collective housing programme implemented by the Community Organizations Development Institute (CODI), a public sector entity.

While calling for a new approach to sustainable cities, Somsook Boonyabancha⁶, director of CODI asks: "how can the system make room for the force of people's creativity to spring up and flourish so as to create this new urban development culture (whereby) instead of the city being a vertical unit of control, smaller units - people-based and local - can be a system of self-control for a more creative, more meaningful development".

In response, the Baan Mankong programme entails a re-configuration of government and institutional practices to include communities as active agents in the development of their own environments, therefore radically challenging the established rationalities around slums, slum-upgrading, needs and community development. And, while the scale and ambitions of the programme certainly pose challenges and limitations to its success, it is undeniable that a structural

⁵ For more information on CODI and the Baan Mankong Programme go to: http://www.codi.or.th/webcodi/index.php?option=com_content&task=section&id=9&Itemid=52

⁶ Somsook Boonyabancha is the Director of CODI and was the founding Secretary of the Asian Coalition for Housing Rights located in Bangkok, Thailand. She began experimenting with the concept of land sharing during the early 1990s as a way of arriving at settlements between slum dwellers and landowners.

change was successfully accomplished in order for creative local initiatives to be supported and mainstreamed into the system (i.e. compost creation for cleaning of waterways/canals, cooperative housings, social enterprises etc). How was this accomplished? In an over-simplistic manner, the programme entails the transformation of social structures and managerial systems, the design and implementation of innovative 'tools of governing' including mechanisms of flexible finance, land sharing, community organizations, networks and cooperation at local, national and even international spectrums (with grass-roots and community-led organizations around the world). Moreover, the programme challenges the normative practices of architects and urban planners, by involving professionals and students (referred to as 'community architects') at different scales of the process and creating professional networks where knowledge is created and transferred on issues of social justice and urban development.

Although briefly explained, this case is an illustration of how local initiatives and creativity can be institutionalised and taken into a wider scale where long-lasting positive impacts can be experienced not only by residents and entire communities but also by a wide range of civil society, grass-roots and professional organisations, related institutions and the city as whole. The case also exemplifies how new forms of institutional and collaborative arrangements can transform normative government and institutional practices and reorganise them into flexible systems where creativity can be mainstreamed and agency can be actively exercised.

Within architectural practices, and with a slightly different approach, the *atelier d'architecture autogérée*, explores the role of architecture through transformative tactics at the local level in parallel to gradual societal change. Particularly relevant to this research, is their use of the term resilience as a concept or lens, similar to 'scarcity', in the sense that it encourages one to rethink approaches and assumptions, in contrast to the common and reductive term of sustainability (Petcou and Petrescu, 2012). It does so by focusing on "how systems can adapt and thrive in changing circumstances" (Ibid: 64), addressing this uncertainty as an opportunity to re-invent and challenge the status quo. Furthermore, R-Urban stresses the unlocking of "the capacity of creativity and innovation at the level of everyday life" in parallel to the study of the administrative blockages (Ibid:66), instead of relying on the arrival of fostering and flexible administrative or institutional arrangements.

Furthermore, this research is interested in their approach of 'Urban Tactics', based on Michael de Certeau's definition of tactics as a practice of resistance through everyday acts. This approach holds a particular relevance to life in informal settlements, with constant change and uncertainty: "Tactics work with time and are opportunistic in their method; they do not 'plan', but use their own deviousness and the element of surprise to get things done" (Petrescu and Petcou, 2013:61).

This section discussed the potential of creativity to address challenges but also its capacity to foster change, a particularly important point to make in any discussion on scarcity in informal settlements. On the one hand, the literature revealed the limitations that creativity can encounter when faced with hostile environments, whether administrative or political barriers, and stressed the role of institutional arrangements in the meaningful and transformative change of communities and their built environment. This is a relevant point to address within this thesis, specially when focusing on informal settlements, often considered 'illegal' and therefore with little government and institutional acceptance or support.

On the other hand, the literature on alternative architectural practices advocates for the importance of creativity based on local and everyday actions and its capacity to engage with and break down barriers within the status quo.

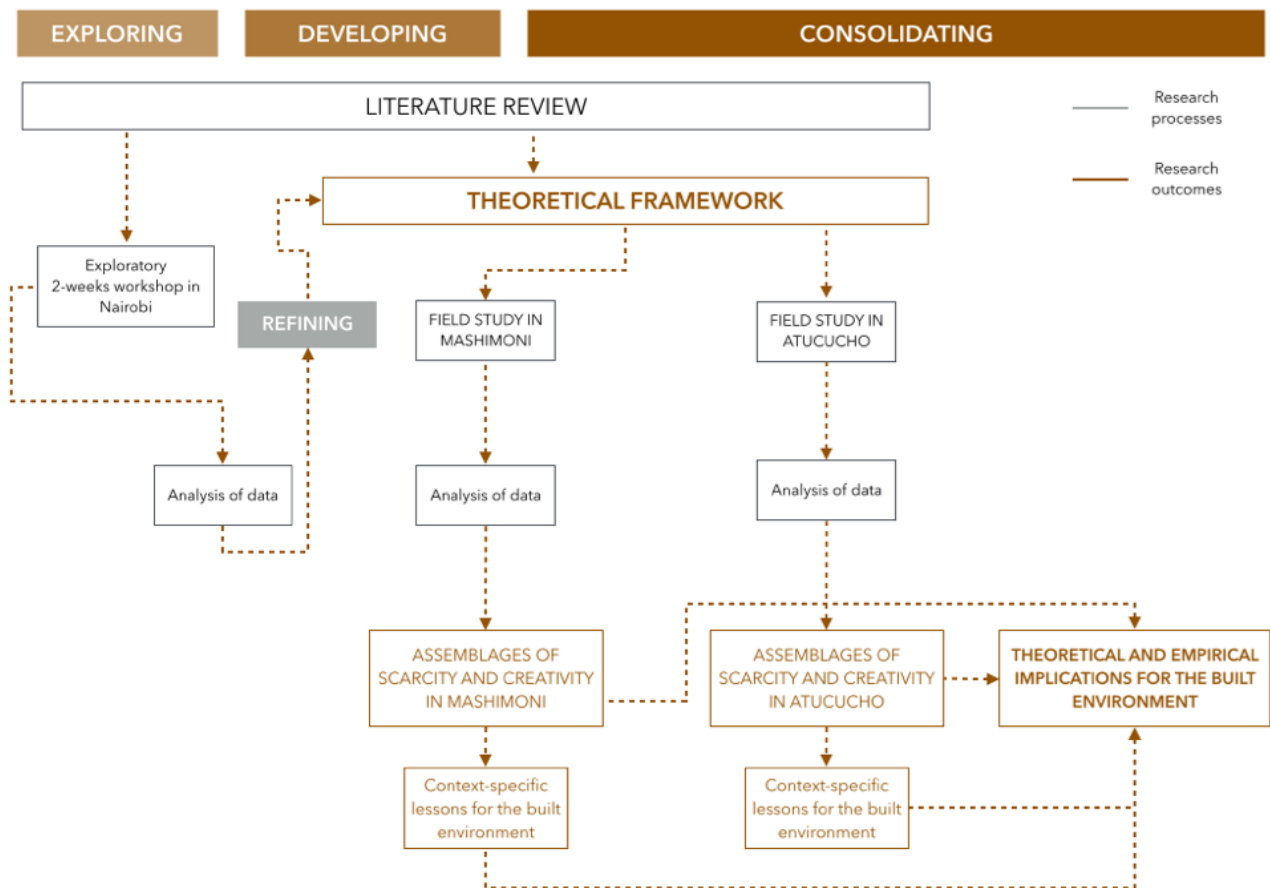
Considering these two different, but not mutually exclusive lessons, this section does reinstate the importance and capacity of creativity in fostering change, but it does so while advocating a balance between local tactics of resistance and addressing those barriers that maintain the conditions one is fighting against.

Based on the previous discussion, the following section will outline the research design guiding this thesis, emerging from the theoretical and practical discussions on concepts and approaches to scarcity, informal settlements and creativity.

1.4 RESEARCH DESIGN

As illustrated through the initial literature review and the research questions guiding this research, it is necessary to develop a research methodology capable of addressing, firstly, the discursive, distributive and spatial nature of scarcity, and secondly, the macro socio-political conditions that govern the construction of scarcity and the localised micro-scenario where tactics are deployed by both users and producers of the built environment. For this purpose, the approach is inductive, aiming to construct knowledge based on data collected through qualitative fieldwork, literature review and analysis of relevant documentation. The research then, is designed through a qualitative, flexible and multi-sited approach, using two case studies as testing grounds to explore socio-spatial dynamics of scarcity at different, interconnected scales.

Fig. 1.1 Diagram illustrating the research design, processes and outcomes



1.4.1 STRATEGY

(a) Initial literature review

Scarcity as a concept has been part of the discourse of many disciplines, including economics and sociology, however its spatial nature has been largely overlooked. Hence, the initial literature review aimed at exploring past and current theoretical and methodological approaches to scarcity to draw the key lessons relevant to socio-spatial processes, particularly in relation to urban areas. This literature review in turn, would inform the methodological approach of the first exploratory fieldwork in Nairobi, Kenya.

(b) First exploratory fieldwork

Step one: [Dis]engaging with scale

Urban political ecology plays a key role in the initial literature review of this research, as one of main disciplines that has engaged actively and critically with issues of scarcity. Apart from developing important theoretical approaches to environmental research, it has also provided methodological tools of relevance to my research design and fieldwork. One of the key contributions has been the critical engagement with scale, and how resources and power flows are influenced by structural processes. Swyngedouw's thorough account of water scarcity in Guayaquil, Ecuador (See Swyngedouw, 2004), offered an overview of how political ecology can uncover the socio-material nature of scarcity, from the analysis of the historical processes of urbanisation, and the management tactics of the residents in marginalised settlements while also dissecting the unequal relations of power, even within the micro-scenarios of the communities and its grassroots organisations.

Nonetheless, this emphasis on power relations, tends to draw a larger picture that relies on mostly vertical relations, devolving the focus and capacity of change to the higher sections of the 'vertical' structure. Coupling this with the postcolonial discourses on urban informality and those dealing with agency and capabilities, reveals a need to expand our understanding of the reality of scarcity and the micro-politics surrounding it at the local level, but most importantly to understand its many linkages with other scales and the fluidity of relations between and across actors, processes and spaces. This is supported with relevant literature on African cities, taking into account the consequences of colonialism, that has shaped urban life in this context (See Pieterse 2005, and Simone and Abouhani, 2005).

Step two: Initial immersion in the field, the workshop as the first exploratory fieldwork

The workshop was my first contact with the settlement, spanning across 2 weeks of intensive fieldwork. It was facilitated by myself in conjunction with the UK-based charity Architecture Sans Frontières-UK and was focused on the village of Mashimoni, within the Mathare Valley, the second biggest informal settlement in Nairobi. Through this time, my focus was on an overall recognition of the whole settlement, to then dwell into more specific particularities. Several methods were tested at this stage, including transect walks covering both the boundaries and inner corridors of the settlement and semi-structured interviews. During this time it was also important to investigate neighbourhood dynamics, starting to identify key “creative agents” among the residents and potential gatekeepers that would accompany me for the rest of the fieldwork.

The workshop also facilitated access, not only to informal settlements in Nairobi, but also to the work of key grass-roots and civil society organisations focused on this context. . An organised city visit offered me the first insight into the challenging existing conditions in informal settlements in Nairobi and the contemporary upgrading approaches such as government-led national upgrading projects and incremental self-built housing in several villages within Mathare Valley. Furthermore, as part of the workshop I co-organised a symposium bringing together actors from civil society, government, academia, community organisations and international development agencies. The one-day event included keynote presentations and discussions regarding the urbanisation process in Nairobi, as well as political and regulatory frameworks that govern built environment production in the city. These discussions helped me to situate myself within the current debates on housing and urban development in Kenya, and offered an overview of the situation and challenges, at least as articulated by the actors represented in the symposium, with regards to informal settlements in Nairobi.

(c) Refining the theoretical framework: towards an assemblage and a diagrammatical approach

Stemming from the first exploratory 2-weeks fieldwork and from further literature review, assemblage theory is introduced here as a theoretical and methodological tool to analyse the data collected (See chapter II). This analysis will use diagrams to illustrate scarcity according to the actors, objects, processes and spaces identified through the fieldwork. The aim is to build narratives based on how scarcity assemblages are constituted and how they function. The resulting categories would aim to

explain the functioning of scarcity as a constructed condition in informal settlements and could be used consequently to devise adequate interventions based on agency and creativity.

Step one: Consolidation of methods, tracing scarcity through actors, processes and spaces

The methodology for the following months of fieldwork was shaped by the initial literature review, the lessons drawn from the 2-week workshop and the introduction of assemblage as an approach to the study of scarcity. Based on this, the methodology pointed towards a qualitative, multi-sited ethnographic approach.

Qualitative research aims to explain phenomena by drawing categories based on stories, connections and events (Mark 1996: 211). It is of particular relevance to fieldwork of an exploratory nature and its concern lies in uncovering 'mechanisms' that can eventually lead to hypotheses based on social reality (Robson, 2011). The aim was to start exploring socio-spatial dynamics of scarcity, including the perceptions and actions of different actors and the dynamic processes embedded in the production of the built environment within the settlement. Once the research departed from the lived experience of the residents, it evolved into a multi-scalar, non-linear approach, by following leads into different realms, jumping from one scale to the other, depending on the processes being mapped in order to bring a series of routine events, unpack them and then uncover the connections to wider processes and elements affecting the settlement and, if possible, the city as a whole.

The methods utilised at this stage are explained in detail in Chapter III, section 3.1.1, and were based mainly on photo-voice exercises, and complemented with in-depth interviews, observation and mapping. Prior to this, different methods were tested, discarded and/or adapted in the field during the first exploratory fieldwork. This was done in order to prove which methods allowed residents to express more freely about their daily life and the constraints they face when transforming their built environment, including their houses and their neighbourhood. During the first two weeks, it became apparent that when enquiring about scarcity and daily life through conventional interviews, it was difficult for residents to focus beyond their pressing needs like food, jobs, school fees and health care. The built environment in this case, would fall behind other priorities.

In response, I made use of methods of a participatory nature, that allowed residents to record their daily life throughout a period of time, and subsequently use those records to tell me their stories. It is

here that I decided to use the photo-voice exercise explained in section 3.1.1. It was particularly important for me, not to interfere with these recordings and not to be present when photographs were taken. This gave residents the freedom to take pictures at night, inside their houses and doing daily activities like washing, cooking, or simply enjoying with their families and friends. It was also an important method to avoid that I, as a researcher, would frame scarcity solely based on the material deprivations highly visible in informal settlements.

Step two: Applying the assemblage and diagrammatical approach in the contexts of Nairobi, Kenya and Quito, Ecuador

Kenya - The case of Mashimoni (How scarcity continues to be reinforced in a specific site)

The first case is located in Mashimoni, one of the 13 villages comprising the informal settlement of Mathare valley (see Ch. IV). Mashimoni became a particular case where deprivation and dire conditions of the built environment makes it almost impossible to investigate how people, overcome obstacles and try to go beyond survival and actually improve their quality of life. In contrast to most cases in Latin America, (see case study two, chapter V) where consolidation happens gradually over a few decades, Mashimoni has remained in a cycle of deprivation and continuous threat for over 50 years. The last few years, particularly after the post-election violence in 2007-08⁷, and the encouraging changes in the constitution, have stimulated new approaches and interventions from the population. This study aims to explore these possibilities, and investigate how creativity may or may not emerge under such entrenched, and long term conditions of scarcity.

At the same time, the dire conditions that are very visible to the eye, make it easy to frame scarcity in material terms: poverty, inadequate housing and almost a complete lack of infrastructure. In contrast, this study aims to uncover the mechanisms of scarcity including but also beyond the material limitations, in order to give a clearer idea of how this settlement has been maintained in these conditions over the years and the key barriers that have impeded the greater effectiveness of the residents' resourcefulness.

Therefore, from this case study, a set of scarcity diagrams will emerge documenting in detail how residents experience and articulate scarcity, but also how they respond to it.

⁷ Explain here the post election violence and it's relevance to this study

Ecuador - The case of Atucucho (How scarcity gives way to a threshold where creativity and change can take place)

The second case study is based on the informal settlement of Atucucho, in Quito, Ecuador (See chapter V). In contrast to Mashimoni, Atucucho has been identified in Quito as one of the pioneers in large-scale mobilisation, complex participatory mechanisms and self-help upgrading strategies. At the moment, Atucucho is the only settlement (formal or informal) to have consolidated a 'Gobierno Barrial' or Neighbourhood Government in Ecuador, taking advantage of the progressive changes in legislation taking place in the country.

Based on this, the application of the theoretical framework and the diagrammatical approach to this case study, will focus more on the analysis of how tactics emerged under the conditions of scarcity and the impact they had on the consolidation of the settlement and the improvement of their quality of life.

1.5 THESIS STRUCTURE

This chapter has introduced the reader to the subject of this thesis, particularly its focus on understanding the constitution of scarcity in the built environment as a constructed condition, and subsequently its focus on exploring how tactics, of diverse negative and positive impacts, emerge under these circumstances. For this purpose, the chapter offered an overview of literature addressing scarcity as the *subject*, informal settlements as the *proposed scenario* of study and creativity as a subject that *relates* scarcity and tactics to socio-spatial change.

The preliminary findings suggest firstly, the need to explore scarcity as a constructed condition with *discursive*, *distributive* and *socio-material* connotations. Secondly, they suggest that informal settlements are unique scenarios where the study of scarcity and emerging tactics can offer new lessons for built environment theory and practice. Nonetheless, the literature review also reveals the need to approach informal settlements with a methodological approach that addresses the non-linearity and complexity of its socio-spatial processes, while also balancing the analysis across different scales, departing from the resident's everyday experience and connecting it to other actors and processes.

Chapter 2 introduces the reader to assemblage theory as the proposed methodological approach to a) deconstruct scarcity in its different components (discursive, distributive and socio-material), b) to approach the complexity, non-linearity and transcalar nature of processes in informal settlements and c) to explore emerging tactics in a critical way. For this purpose, the literature review addresses how assemblage theory has been applied in architectural and urban studies, relating it to the different scales of intervention, including the place and the everyday, the neighbourhood and the city, and finally, processes of urbanisation, inequality and exclusion. The lessons from this review include firstly, a set of implications of applying an assemblage approach to this research, secondly, the introduction of a diagrammatic approach to analyse assemblages of scarcity and emerging tactics, and lastly, a proposed conceptual framework to guide the fieldwork and further development of this research.

Chapter 3 develops the methodological approach of this research drawing from the conceptual framework proposed in chapter 2. Firstly, it outlines the proposed methods to capture everyday experiences of scarcity in the built environment, following a post-colonial approach to fieldwork that emphasises the construction of knowledge through participatory methods. Secondly, it outlines, step by step, how diagrams can be used to visually represent the data as an assemblage and analyse its many linkages across scales. The outcome of this chapter is a methodological template and considerations that will be applied to the case studies in subsequent chapters.

The following chapters, **4 and 5**, are focused on the two case studies based on the informal settlements of Mashimoni, in Nairobi, Kenya, and Atucucho, in Quito, Ecuador. Each chapter is divided into two parts. **Part I** explores the socio-spatial dynamics of scarcity in the built environment of each settlement. This exploration includes a) an analysis at the city and institutional level, outlining the urban dynamics surrounding the emergence and consolidation of informal settlements in the specific city, b) an analysis of the settlement, including its emergence, consolidation and current situation, and c) an analysis of scarcity departing from the everyday experience articulated by the residents and subsequently, evolving into a diagrammatic socio-spatial analysis at different scales. The result is a set of diagrams depicting the 'scarcity assemblages' for each settlement and the relevant preliminary lessons for the built environment.

Part II of each case study, is focused on the analysis of the tactics emerging in each settlement under conditions of scarcity. This analysis consists of applying the assemblage methodology to deconstruct and understand each tactic, to subsequently juxtapose this data into the scarcity assemblages. The resultant visual representation will show how the scarcity and the tactic relate to each other and the kind of impact each tactic exerts into the scarcity in question. Part II then, draws out key findings on the relation between creativity and scarcity, and the preliminary lessons relevant to the production of the built environment.

In terms of its focus, **Chapter 4** introduces the reader to the case study of Mashimoni, in Nairobi, Kenya. This case study is based on an settlement with acute deprivation and a very tangible scarcity in terms of its built environment, a situation that has remained mostly unchanged for over 50 years. Mashimoni has also undergone a catalyst event with the post-election violence between 2007-08, which activated a series of tactics in response to different scarcities identified by its residents. This chapter will investigate how the conditions of scarcity are experienced, how they have emerged and how they are sustained, while also exploring the current tactics and their potentiality to overcome long-standing barriers to its own improvement.

On the other hand, **Chapter 5** is focused on the consolidated and highly organised informal settlement of Atucucho, in Quito, Ecuador. This chapter will focus on a retrospective account of scarcity, drawing from the stories articulated by the residents on how they experienced scarcity at the time of occupation, and how they took part in the development of the settlement throughout 25 years. It will investigate how residents responded to the almost complete absence of housing and services and the impact of these tactics in the built environment.

Finally, **Chapter 6**, will revisit the initial findings and discuss key lessons pertinent to those producing the built environment, including dwellers, built environment practitioners and policy makers. The chapter will also dwell on the relevance of an assemblage approach for the study of scarcity in the built environment, drawing the limitations of this approach and suggestions for further research. The chapter will finish with a note on the relevance of this study for understanding similar issues in the Global North.

This chapter aims to introduce assemblage theory as the overall approach to understanding the constitution of scarcity, to consequently draw a conceptual analytical framework that informs the methodological approach to this research.

The previous chapter focused on the conceptual exploration of scarcity, creativity and informal settlements. From this analysis, scarcity emerged as a condition that goes beyond material resources or commodities (and sometimes is not even material in the first place) and that can take different dimensions in relation to how resources are managed, controlled and distributed, and in relation to how we build knowledge and discourses around them. In order to understand the constitution of scarcity in the built environment, and based on the previous analysis, the need emerges to firstly identify these different aspects of scarcity and understanding their relation to spatial production.

In the context of this research, it is the premise that the analyses of the constitution of scarcity in the specific context of informal settlements, can give us not only a better understanding of how scarcity unfolds into specific spatial patterns and social practices and strategies, but also that the understanding of its construction and possibilities can offer a better view of what forces come into play in order to either, *reinforce* a condition of scarcity or actually, *facilitate* change to happen.

Informal settlements in the global south, as different and varied as they are from each other, are continuously attached to images and notions of poverty and deprivation. In the midst of this integrated, versatile and many times resilient strategies, it cannot be denied that situations of precariousness and slow accumulation of resources (a very apparent scarcity) are a common feature in informal settlements that shapes the way that the built environment is produced and constantly reproduced. Therefore, based on the previous chapter, we can ascertain that these processes exist, but very little is in the literature, that documents how these processes actually shape the built environment (relation between scarcity and socio-spatial production) and the individual and collective social practices that emerge under these circumstances.

Furthermore, from this marrying of concepts (scarcity and socio-spatial production in informal settlements), the ultimate aim is to understand how the relation between these two can offer a better understanding of socio-spatial change: How change happens within conditions of scarcity? What are the common denominators in creating 'pockets of scarcity' that never fade and withstand the intervention of external actors? How do scarcity and the particularities of spatial production in informal settlements offer possibilities for change?

Three things were identified as being needed in order to understand scarcity, with all its dimensions, and the spatial patterns and social organisation of informal settlements in relation to socio-spatial change, with all its constraints and possibilities:

- To acknowledge the non-linearity of spatial production and social practices and processes in informal settlements.
- To acknowledge the need to depart from an ethnographic approach that is grounded largely in everyday life and not in external notions of what scarcity constitutes
- To acknowledge the fluidity of linkages between large scale processes through which scarcity is constructed and the on-the-ground practices that shape and reshape the territory.

In order to illustrate how an assemblage approach may offer us the conceptual tools to understand the construction and possibilities of scarcity, firstly, the chapter will introduce assemblage theory as based on the philosophical writings of Deleuze and Guattari (1987/2004), and as developed mostly by Manuel DeLanda (2006) as a theory of social complexity. Secondly, the chapter will address the connections between an assemblage approach and the exploration of, (a) the linkages between grounded scarcity (processes, territory and practices) and the distributive, discursive and socio-material nature of constructed scarcity; and, (b) the understanding of the threshold where constant becoming takes place (where scarcity reinforces or opens possibilities for change). It will do so by reviewing different assemblage approaches related to the study of place, the city and urban change, and developed mainly within the fields of urban studies, critical geography and critical urbanism.

From this review, the chapter will draw a set of analytical concepts that can be used as a framework to inform the methods for investigating scarcity in the built environment, including its construction and the mechanisms through which it reinforces or transforms a particular condition.

2.1 AN INTRODUCTION TO ASSEMBLAGE: AS APPROACH, AS DESCRIPTOR, AS MEDIATOR OF SCARCITY

Assemblage, coming from the french term *agencement*, meaning layout or arrangement, makes reference to a dynamic whole, whose function and effect is based on the relations and flows between its components. Hence, focussing not on what an assemblage **is**, but how it **functions** and what it **does**. In the same line, the first key aspect of assemblage is its concern with how elements come together and relate to each other, a relational (hence, not static) process of “arranging, organising and fitting together” (Wise, 2006:77). This concern with how dynamic systems emerge through linkages and how we can account for this process, opens a window for the study of anything that is diverse and contingent (not to be confused with chaotic, as nevertheless, within its mechanisms, underlies a certain order that maintain its existence).

Manuel DeLanda (2006), applied Deleuze and Guattari’s (1987/2004) philosophical teachings, to conceptualise a new theory of social complexity, one that conceives society as an organic system, one that is determined by its relations of exteriority, rather than the isolated function of its interior, “a relation may change, without the terms changing” (See Deleuze and Parnet, pp55). This could be relevant when talking about mobilisation or transformation of particular relations, not necessarily the input of more resources.

Another key dimension of assemblages, is the concept of territories. An assemblage goes beyond the gathering of elements, as its function is determined by the effects and expressions that result from the interactions between these components. “Assemblages create territories. Territories are more than just spaces: they have a stake, a claim, they express (my house, their ranch, his bench, her friends)” (Wise, 2006:78). According to Dewsbury, a key aspect of understanding Deleuze and Guattari’s assemblage, is its tetra-valency, the fact that it focuses on four ways in which elements come together and combine: *machinic content* and *collective expression*, and *territoriality* and *detrterritorialisation* (Dewsbury, 2011:149). For him, this tetra-valency plays out in two ways: through the relation between content and enunciation (how a machine is constituted and what message it

transmits and the effect it exerts) and between stabilisation (a process of homogenisation towards stability) and deterritorialisation (a process of disruption that increases the heterogeneity of the whole) (Dewsbury, 2011:150). Dewsbury relates this relational and contingent approach to the great complexity that characterises current society, with virtual networks, rapid mobilisation and constant change. He argues that is necessary to apply a lens that encompasses all these complexities, in a manner that resembles its non-linearity, the flows and constant change (Dewsbury 2011:149). Based on this, he argues that assemblages offer a wide range of flexible concepts that allows us to unpack the social and unveil connections therein more creatively.

Another key aspect of assemblage, as conceptualised by Deleuze and Guattari, is that an assemblage does not exist in isolation, it can be part of other, larger, assemblages. "Assemblages select elements from the milieu (the surroundings, the context, the medium in which the assemblages work) and bring them together in a particular way" (Wise, 2006:78). This aspect is useful to understand larger processes, within which and with whom a specific assemblage is interacting and being part of. "The concept of assemblages show us how institutions, organisations, bodies, practices and habits make and unmake each other, intersecting and transforming: creating territories and then unmaking them, deterritorialising, opening lines of flight as a possibility of any assemblage, but also shutting them down" (Wise, 2006:86). Hence, whether it is a concept, a situation or a space, it never exists and functions in isolation, maintaining a connection with other entities, which can be in a contingent manner, not quite predictable or easy to uncover (Phillips, 2006). By accounting for one specific assemblage, you can learn how it functions and what it does, but some of its aspects may be influenced by its interaction with other assemblages, and in jumping into analysing this relation of exteriority, makes it possible to address a specific issue with a wider approach, and in so, discover other aspects that may be crucial to the initial questions and discoveries.

The previous authors make reference to the territorialisation and deterritorialisation process that make assemblages a constantly changing whole. But it is Delanda perhaps, in his conceptualisation of a theory of social complexity, that dwells on a more spatial aspect of these two key processes (Delanda, 2006:13). He makes emphasis that territorialisation can take both a spatial and non-spatial nature. The former can refer to a spatial boundary that is inscribed by the relations of different elements and the stake they take on it, in the form of a dwelling, a sidewalk or a region. In more

architectural, and urban terms, territorialisation can refer to the organised invasion of a vacant plot, with the gradual building and upgrading of houses as the 'inscription of boundaries' that makes that occupation more ingrained, consolidated and established in that specific land. But this inscription of boundaries, or territorialisation, can also be through immaterial means, such as political alliances, or clientelistic relationships, that tacitly legitimises permanence and continual growth, and therefore provides 'gifts' in exchange, like provision of basic services and social infrastructure.

Using a building as an example, instead of looking at a building as a noun, an object with its specific properties and image, assemblage approaches it as a process, a whole that is only emerging and exerting an effect, because of how its different heterogeneous elements (both internal and from the milieu it is placed on) have come together and continue to interact with each other. This interaction, which varies according to time and intensity and the elements that interact, creates the function of the building (its character, its sense of place, environmental efficiency and so on). This relations of 'exteriority', makes it possible to not predetermine the understanding of a building as an isolated and static object, brutally material and only based on its tangible qualities (materials, facades, interiors), but by how it functions under different circumstances (according to time, tacit rules mediating its use, the people using it and so on) and how it interacts with its surrounding context. It is only then, that we can know the capacity and effect of that building. To bring Deleuze's own words: "We do not know what an assemblage is, until we find out what it can do" (Deleuze and Guattari, 1987:257). Many public spaces are governed by tacit rules that impeded appropriation by the public, whether these are prohibiting signs, the presence of authoritative figures, the design of the street furniture, the presence and attitudes and practices of specific groups or the qualities of the building materials. The public space cannot be defined by the fact it is seemingly 'open', located without any enclosure, or by the brand new set of playground equipment that was just installed. It can only be understood through how all these elements interact and create different effects on its users, a sense of place, an invitation to freely express, encounter or speak up.

This multiplicity of relations can be even more intense in dense informal settlements, where nothing is exactly what it seems, and one space can have many meanings and uses, at different times of the day or even of the year. A small open space within a labyrinth of houses, becomes public or private according to the activities taking place, the person that inhabit it in that specific moment, the domestic utensils that are left outside. The interaction of these elements, say, through chatting and

gossiping, may be more inviting to consider the space as public, as opposed to the interaction between domestic objects, domestic activities, the presence of children, which may give the impression the space is more private, belonging to a specific family that is undertaking more intimate activities.

Perhaps at this point is important to emphasise, that assemblage can easily be misunderstood as just the gathering of elements, the coming together of heterogeneous entities and ideas in a non-linear way, which could easily be seen as 'chaotic' and random. A vision that doesn't fall far from the idea that emerges when you see an image of a dense, intricate informal settlement. But assemblage goes beyond 'the coming together': "It's not a matter of bringing all sorts of things together under a single concept but rather of relating each concept to variables that explain its mutations" (Deleuze, 1997:31). Assemblage is both an approach to how things work and function and a way of thinking, one that enables "linkages or connections between different systems of knowledge formation" (Kaufman and Heller, 1998:5). To account for these linkages and variables is crucial to understanding what goes on during the territorialisation and deterritorialisation process, as Delanda put it, to understand what "consolidates and rigidifies the identity of the assemblage or, on the contrary, allows the assemblage a certain latitude for more flexible operation" Delanda (2005:18-19). This 'coding and decoding' is crucial to understanding the reinforcement of scarcity and the space for change.

This thesis seeks to operationalise assemblage theory for understanding the relationship between scarcity and spatial production and the subsequent potential for socio spatial change. This first introduction to the different takes into assemblage, leave us with the relevance of assemblage theory to the study of complexity caused by the gathering of heterogeneous elements and the ephemeral characteristics of not only social life, but more specifically of the built environment, particularly with the examples of the building as a verb and informal settlements. This clearly starts by building a connection with the very micro, socio-materiality of the built environment but also with its relation to wider scales, or assemblages. In the next section, this theoretical concept will be explored through its application in the architectural and urban studies, in order to dissect what lessons can be learned from this, particularly to inform the operationalisation of this theory into a descriptive and analytical tool that not only helps to account for everyday phenomena and processes but also analyses its multiple and intricate relations with wider urban processes.

2.2 ASSEMBLAGE THEORY IN ARCHITECTURAL AND URBAN STUDIES

2.2.1 MICRO-COMPLEXITIES WITH MACRO REPERCUSSIONS: ASSEMBLAGE THEORY TO UNRAVEL PLACE AND EVERYDAY IN RELATION TO URBAN LIFE AND URBANISATION

This section will analyse how assemblage theory has been used in architectural theory and urban studies to understand everyday life and issues of place and identity. It will draw key concepts that are relevant to the study of scarcity in the built environment, particularly in relation to the socio-spatial processes that shape and unfold within informal settlements.

Recently, Kim Dovey (2010) and Abdoumalig Simone (2011), have used assemblage as an approach to the study of places, along with the application of a variety of concept tools deriving from the philosophy of Deleuze and Guattari and from the adaptation or subsequent development from Manuel Delanda. For example Dovey, focuses on the study of how places function and grow, putting emphasis on the constitution of places as entanglements of human, non-human, temporal and discursive elements, and how these elements interact between in each other to make up the character and identity of these places (Dovey, 2010).



Fig. 2.1 Diverse activities and uses of the main roads and corridors in Mashimoni, one of the case studies of this research

Dovey and King (2011) have recently applied assemblage theory to study the morphology and image of informal settlements, by deconstructing how settlements emerge and develop, to subsequently draw typologies that can challenge the current 'spatial' language of informality. The authors are interested in understanding the complex process through which settlements grow and adapt and the range of territorial types within which informality develops though time under specific forces driven by *scarce material resources* and *economic imperatives*. This focus has a particular

resonance with how scarcity shapes the territory, as indeed it is known that people live with scarce material resources and within marginal environments, but how this has a particular effect in the set of decisions and practices that goes into creating a territory -such as the social relations and organizations that take place- remains an obscure picture, that more than often is either romanticised or criminalised. As Dovey and King note, the priority should be to understand it, and then reshape the image of what it really means (Dovey and King 2011:13).

Dovey and King, through their focus on urban form argue for the use of diagrammatic tools to understand these settlements as dynamic 'assemblages' in constant transformation and most importantly, arising from conditions of limited resources. This approach is of relevance to this research, for both methodological, theoretical and practical reasons. On the one hand, they are focused on understanding informality from its urban form, especially as many architects and urban planners, when confronted with the complexity of informality, disregard urban form and design as secondary and refocus their efforts towards planning processes and policy. They do this as very little literature actually explores built form as part of the process, as it is treated more as 'a neutral background to issues of process, economics, tenure, employment, infrastructure and politics.' (Dovey and King, 2011:84) Therefore, the authors argue for a methodology that is successful in marrying the social with the material, without delegating the physical to the background, thus increasing the potential to influence built environment related fields (i.e. design, planning etc.) in both their approaches and their language.

An example of this is the invisibility of some very physical factors that more than often remain unaccounted for, like informal markets of electricity or sub-letting of spaces for temporal storage etc. that are intrinsically entangled with social processes and make up complex orders that might hold answers and lessons for the understanding of phenomena or the settlement as a whole (Dovey and King, 2011).

Dovey's focus on morphology is also tied to the study of complex trade-offs that emerge from the integration of space, social networks, economic and at times political relations and imperatives. Using the example of Sidomulyo/Kricak and maps of footprints and functions, he illustrates how unlike a planned neighbourhood, the spatial structure emerges as an accumulation of bottom-up acts mediated by a field of spatial, economic, social and political opportunities. These processes are

informal but not random or chaotic. Each house that is built contributes to the overall plan without any formal systems of control in place. Such settlements, with a seemingly random layout, are not exempt of order, as it is often that services, subdivisions and land allocations are managed through certain forms of control and tacit rules, that continuously shape the spatial layout and built environment (Dovey, 2010).

Simone (2011), one of the authors that makes specific reference to the particularity of African cities and everyday life, as mentioned in the previous chapter, also uses some concepts from Deleuze. He adapts the assemblage approach into the term 'surfaces', or how space unfolds repeatedly and in many directions, in order to uncover more "iterative opaque processes of adaptation, hesitation and collaboration" (Simone 2011:341). He makes reference to our fear of engaging with the apparently complex and chaotic. Simone argues there is a "fear of messiness, the self-built, the street, the convoluted and complex" (Ibid:357). This same fear can be attributed to the lack of understanding of such intricate contexts, which leads to an easy 'predetermination' or 'labelling' by jumping to easy generalisations (Ibid:357). Through this approach, Simone, in a similar line as Dovey, refers back to the issue of visibility, by making reference to how the image of the urban, with all its complexity and overwhelming scale, obscures the contribution of the active engagement of the great majority of people in cities (living in low-income, informal settlements) in reshaping urban space and life (Ibid: 357).

This can be related to the temporality of how open spaces are used within the settlement, the constant fear and exposure to eviction, by the structure owners and/or the authorities, the change in weather, that in some cases happens very drastically but that has a profound effect on the tactics they need to deploy to carry on with everyday life and activities. Open spaces for example are highly dynamic, contingent of many elements and relations between them (weather, conditions of infrastructure, accumulation of garbage, evictions, church activities and festivities, holiday seasons, time of day that influences also when to wash clothes, when children get out of school. Residual spaces are constantly appearing in the settlement, whether because of evictions, fires or other events, and they are constantly been occupied, vacated, shared and contested between different groups within the settlements. Land grabs, even at a micro level, are quite common within the settlement. Some happen gradually and slowly, and even remain unnoticed, especially with regards to churches. However they also happen at the individual level. This has led to disputes, that are

commonly settled through the elders of the village and through the assistant chief. Structure owners are also constantly changing the landscape of the village, adding more and more structures and transforming their current 'stock', sometimes by acquiring more land, but in the majority of the cases, it seems this process is taken on a vertical level, adding second stories to already existing, precarious, structures.

Another example is the way women's saving groups work. They meet in their own homes, for a variety of reasons. For instance, the fact that they lack spaces for social encounters, gathering or for leisure. In some cases, depending on the size of the house and the number of people attending, they are forced to use the corridors in front of the houses. However, some of the groups stated that meeting in each other's houses also allows them to see how the members are investing their loans. As many of the businesses they embark on are home-based enterprises, these meetings also serve as an informal monitoring mechanism through which they can assure members that they are investing their loans properly and efficiently. There is also the fact that many of these saving groups serve as counselling and training services, which sometimes involves discussions of delicate and private issues, such as bringing up children, solving marital problems and other logistical topics, like managing money more efficiently and so on.

2.2.2 NEGOTIATION BETWEEN SCALES (HOW PLACE AND SETTLEMENTS CHANGE)

In line with the findings in chapter 1, one of the key aspects of informality is the multi-scalar analysis needed to understand it, on par with the complex ways in which scales are interrelated through intricate processes that range from activities at the micro scale to city-scale dynamics. "Universality can never be avoided and those who seek to do so... only end up hiding rather than eliminating the condition. But universality must be construed in a dialectical relation with particularity. Each defines the other in such a way as to make the universality criterion always open to negotiation through the particularities of difference" (Harvey 1996:362).

One of the key aspects of assemblage thinking, at least in theory, is the negotiation between scales versus topdown or localised approaches. Assemblage thinking aims to engage with the multi scalar, without reducing the micro. It avoids attributing the power of change to one scale or the other, by focusing on understanding dynamics of change between scales, in search of synergies or points where change at a particular scale can resonate and influence other scales . Although this seems to be aligned with the objectives of this research, the following examples will show some of the

previous attempts to understand this scale dynamics of change and will aim to identify key guides as well as challenges to take into account when developing the methodology and approach to the case study research.

Dovey, with his interest in assemblage and multi-scale connections argues that “While an informal settlement can be identified and territorialised as a discrete assemblage (as a noun), it is assembled (as a verb) through its multi-scale connections with the political economy of city, nation and globe.” (Dovey, 2012:358). He advocates that an assemblage approach, could facilitate this negotiation between scales, especially because it allows an understanding of change at the very local, complex and often obscure level, rendering more visible those intrinsic connections that are abundant in informal settlements. It is not enough to understand the local, but more importantly to uncover and understand the relations and dynamics between scales (Dovey, 2012). He illustrates this point through the analysis of markets and its connection with global economies and interwoven and complex relations that navigate between the formal and the informal, many times, in an obscure and hard to decipher or distinguished manner (See Dovey, 2012). For this purpose, he has used the similarities between Deleuze’s binary concepts *smooth* and *striated*, to describe and analyse the spatial and socio-economic composition of informal markets (See Dovey, 2010, 2012).

In a similar line, Simone argues for this negotiation between scales, in the form of a distributed agency, across the city, multiple events, components and places. He gives the example of the efficacy of Tonah Abang market, where its function and relations of exteriority are dependent not on an imposition of a given form or practice (hierarchical), but on an incessant process of give and take, that at the same time is tied to multiple scales and relations of capital. Nonetheless, he acknowledges the shortcomings of going beyond the tracing or description of these linkages between specific sites and processes of urbanisation, towards a clear understanding of its inner workings and potentials. (Simone, 2011).

To conclude this section, the following lessons can be extracted with regards to assemblage and place:

- The increasing complexity acknowledged in the production of space and places; particularly in relation to temporal rhythms, meanings attached to place, creation of identities and socio-spatial

practices; makes assemblage thinking a convincing option for an approach, through its relational nature and capacity to account for, and potentially, understand, the social and material constitution of space.

- The work of Dovey and Simone began establishing the relation between the visibility of informal settlements and the discourses surrounding them and how these inform the design and planning approaches or interventions imposed on them. This by itself show us how micro realities have a direct relation to wider processes that can be economic, social or political.
- At the same time, their work also shows the challenge to engage place-based socio-spatial processes and practices, with a wider political economy, *beyond the description* of the linkages. How do we really determine how enrolled specific local processes and practices are within prominent logics of capital accumulation and urbanisation? This question will be reconsidered again in the next section, when dealing with the debate on city as assemblage.

2.2.3 THE CITY AS ASSEMBLAGE: COMPLEXITY, URBANISATION AND THE ENGAGEMENT WITH POLITICS

This section will engage with recent debates on the 'city as assemblage', particularly in reference to the *discursive* and *distributive* nature of *scarcity*, and to the planning and political practices that unfold in all scales of intervention in the built environment. The aim of this section is to engage with the main critique toward assemblage theory in critical urbanism, that is, the danger of 'depoliticising' discussions and analyses on socio-spatial change and urbanisation. In order to do this, this section will draw key aspects from the debates on assemblage theory that can help clarify the connection between 'experienced scarcity' at the local level and the wider processes that influence 'constructed scarcity'.

In critical geography, assemblage has been used recently "as a descriptor of socio-material transformation, and second, in relation to urban policy mobilities" (Mcfarlane, 2011a:206). On the one hand, Mcfarlane (2009, 2011a, 2011b) argues that assemblage thinking is particularly useful for conceiving the spatiality of the city as a composition of human and non-human relations, and that by studying this continuous emergence and process of arrangements, certain lessons can be extracted in order to understand specific aspects within the urbanisation process.

Shane (2005) also makes reference to the non-linearity of assemblages to describe the complexity of the city as a composition made out of various autonomous systems, and relate it to the hierarchical planning processes and discourses that attempt to shape and transform the city. He makes reference to the incongruence between the specific emergent logic of the city, where different actors work in flexible ways across territories, with the imposing of wide-ranging regulations that fail to grasp and engage with this complexity, losing an opportunity to experiment with new logics at the planning and design level. Nonetheless, he does not advocate acknowledging and working within logics of chaos, with no control or regulations, but for articulating democratic alternatives that make new multi-layer planning approaches operational.

2.2.4 RELATION TO URBANISATION, INEQUALITY AND EXCLUSION

Assemblage has been the subject of a recent debate, particularly Brenner et al (2011) with regards to its contribution to critical urbanism, in terms of engaging with political and normative factors of the city. This debate acknowledges the descriptive quality of assemblage thinking, as a useful approach to delineate the compositional aspect of the urban, nonetheless, is still sceptical of how it could engage with wider geopolitical economy and don't lose sight of the pervasive power of capitalism that models current urban trends.

In contrast, Dovey (2011) emphasises on the danger of valorising the hierarchy of scale and the large (global, capitalism) over the small. Prioritising the root cause (i.e. capitalism) over the understanding of processes of urbanisation and change, often leads to explanatory conclusions before even engaging with the complexities of everyday life and micro-politics, overpassing key potential lessons.

On the other hand, Wise argues for the relevance of assemblage thinking in facilitating a negotiation between scales, where assemblages are analysed as 'regimes', giving answers or explanation only when analysed as collective apparatuses, across scales (Wise, 2006:86).

In the same line, Rankin (2011) is sceptical of the efficacy of assemblage approach in confronting the structural bases of poverty and exclusion. This is particularly relevant to scarcity and the danger of remaining stuck in description and ground analysis of particular conditions. She acknowledges the potential of Assemblage thinking, only when it is capable of revealing 'a context within a context', making visible several multiple scales and processes, and therefore opening lines of mediation that make it analytically and politically productive.

Rusell et al. (2011) argue that one of the strengths of assemblage thinking within the political realm relies in the fact that it can be used to better understand social organisation and political action, and its interwoven relationship with materiality of space and the city and the resources. Assemblage thinking encourages a more pragmatic approach that may offer ideas born from the understanding of self-organisation and how they can expand the 'spaces of collaboration, co-operation and community'. In this line, the notion of assemblages has also been used to understand the functions and what goes into the maintenance and effective functioning of social movements and similar organisations. It has also been useful to articulate mobilisation and its relation to spatial concepts, such as territory, scale and networks (Davies, 2012). In the case of Davis, he studies the routine undertakings of a social movement within the spaces of their offices, however he identifies dynamic processes that spill over the spatial boundaries and interconnect in different ways with actors and processes at a regional and global scale. He examines the influence of routine processes, relations between the staff and 'non-human accounts', and the effect of this in the maintenance, effectiveness and even credibility and legitimacy of the organisation. In the case of Mashimoni, this is important, not only because the majority of the movements encountered in the field have a role in the production of the built environment and are built through quotidian socio-spatial realities, but also because in this examination through assemblage theory, it may be possible to identify potential for intervention in a way it can have a direct and meaningful impact on scarcity processes in the built environment.

The processes that allow different actors to become part of the assemblage also allow others to leave – the processes of emergence and coherence mean that the assemblage is always in a dynamic state where different actors appear powerful at different times.

This is particularly relevant to the fieldwork in Mashimoni, which emerged through the close involvement with a local grassroots organisation. This movement has a key role in the development of this research as it is the only one dealing with a specific agenda focused on the built environment, mainly through service provision and advocacy for housing and land rights. Since the beginning, it was possible to observe, and in some cases, engage with the quotidian activities of the movement, from advocacy and mobilisation activities (rallies, film screenings, meetings with officials and CSOs) to organisational procedures (regular internal meetings, enumeration and collection of savings across the neighbourhood and so on). The observation provided a window into the challenges that

the movement faces at many different levels, including gaining and retaining legitimacy within the neighbourhood and with the authorities; expanding and recruiting new members, and retaining coherence and the commitment and active involvement of current members. The fieldwork also allowed the engagement with non-members within the settlement, which represent roughly two thirds of the households in Mashimoni. Through semi-structured interviews as well as informal conversations, it was possible to get a insight on how the movement is viewed by outsiders and the reasons that preclude them from joining. Furthermore, it was possible to talk to the least engaged members of the organisation, mainly those who still considered themselves members although they do not attend meetings or contribute with savings, or those who can only do it sporadically. Exploring the movement from these outside perspectives revealed the difficulties of being part of a collective on a regular basis, when financial, time or even ideological constraints get in the way of being more active. Assemblage thinking offers a critical lens to study these circumstances, to understand the fluidity of a collective that is in constant change, a state of 'becoming' where members come and go and organisational coherence varies across different times of the year and political circumstances.

Assemblage thinking can also be used to examine the emergence of social movements, by examining "the coming together of a variety of relationships of materials, discourses and collectives at one time" (Davies, 2012:277). This has particular relevance to many of the youth groups that participated in the fieldwork. The maturity, experience, motivation, impact, coherence and level of organisation varied immensely from one another. In one case, it was possible to observe the mere inception of the group, which emerged through the occupation of a residual space, that despite it being in a main internal corridor and therefore highly visible, it remained empty for a long time. Through a conversation with them, it was possible to track how the group planned the intervention, the motivation behind their actions, and the resources and avenues that made it possible.

Swanton argues that assemblage thinking gives emphasis to the agency of the material and of people, considering the material as something more than the background or container of social unfolding. Moreover, it gives the material an active participation into the shaping of urban life and inequality in the city (Swanton, 2011:344). This has relevance to how scarcity may be shaping the urban territory or its effect in spatial formation, with all its socio-spatial considerations and components. What it is the agency that runs or gives life to spatial patterns within the limits of

scarcity? Moreover, what may be the relation of scarcity, spatial formation and inequality? This is a difficult nexus to make, how do we go from detailed ethnographic research and 'thick description' into a wider understanding of inequality processes? Is this possible through the understanding of the dynamics between scales? How do we uncover these dynamics?

Although assemblage in geography has developed from network thinking, assemblage thinking in contrast, has an alternative affirmation, "through understanding the make-up and organisation of the social in more inventive and experimental ways", working, in contrast to networks, "across, not quite against, the discourse of globalisation and capitalism" (Dewsbury, 2011:149).

2.2.5 LIMITATIONS

Based on the critical assessment of assemblage in architectural theory and urban studies, this section will draw the conceptual and practical challenges of the application of this approach to the understanding of scarcity in the built environment. These considerations will be taken into account in the development of the following section.

(a) Complexity and the danger of indefinite openness

There is the danger that assemblage, with all its flexibility and openness to understand the world, as broad as it is, can easily give way to be appropriated in limitless types of assemblages, "becoming everything, amounting to nothing" (Dewsbury, 2011:149).

(b) Returning to 'Small is beautiful' or reductive conceptions of change

As illustrated in the previous sections, assemblage thinking has been useful to account for the complexity of local realities, its human, non-human, temporal and discursive elements. But there is the possibility that this research will encounter a challenge in making the connection, between a condition that departs from the very personal and collective experiences of scarcity, into a non-linear reading of a constructed scarcity, and ideally into connecting the dynamics of these processes with wider economic and political agendas. Is there the danger of either losing the grasp of the grounded realities by diluting them in the journey towards the 'global' (which can be the case in Urban Political Ecology) or falling into the mundane, or 'small is beautiful' where the synergies between small scale adaptations and innovations and urban change remain unfulfilled, never found

or obscured? Is there the danger in being reductive in both ways? Throwing all the fault to 'capitalism' or resorting to small is beautiful approach?

(c) Assemblage and its engagement with politics, capital and wider processes

Through the previous discussions, one can identify the challenge of marrying the messiness of assemblage thinking and the legitimisation of its engagement with political economy. Although the assemblage approach may be capable of addressing complexity and give a clearer view of urban processes, in this case spatial scarcity and the production of space, it may still be short of addressing the wider process. There is the need to illustrate more clearly this marriage and its practicality in terms of how we grasp this knowledge and use it to respond through interventions or not.

2.3 IMPLICATIONS OF AN ASSEMBLAGE APPROACH FOR THE STUDY OF SCARCITY IN THE BUILT ENVIRONMENT: TOWARDS A CONCEPTUAL ANALYTICAL FRAMEWORK

This section will address assemblage theory and its previous application to the study of place and the city, to consolidate a set of concepts that will guide the methodological approach of this research. Based on this analysis, this section will also introduce 'sites of scarcity', a concept based on the site ontology developed by Theodore Schatzki (2002).

2.3.1 ASSEMBLAGE THEORY, SCARCITY AND THE SPACE OF THE ACTUAL IN THE BUILT ENVIRONMENT

In this section, assemblage theory is used as a descriptor to start accounting for the constitution of scarcity in the built environment:

(a) Sites of Scarcity: scarcity as a socio-spatial reality (How scarcity is experienced in the built environment)

This section introduces 'sites of scarcity' as the milieu where the experience of scarcity unfolds, and that only comes into existence through the relations between components (human and material) and practices. The term is based on the site ontology of Theodore Schatzki, that aims to provide a framework for understanding social life and its multiple avenues for change. Nonetheless, he doesn't offer a framework for explaining change, other than implying that by accounting the agencies that made it possible we can arise to explanations of change, (Schatzki, 2002:xv).

Sites as conceived by Schatzki, do not limit themselves to a physical container where social life unfolds. It is a milieu that only comes into existence through the relations between components and practices, and their subsequent effects and expressions. In the case of this research, although the site becomes the spatial container of the experience of scarcity, it only emerges as a site because of the narratives of scarcity bounded to it and unfolding within it. "We can talk about the existence of a given site only insofar as we can follow interactive practices through their localised connections" (Marston et al, 2002:425). As the following chapters will show, this can happen in a specific place, like a football pitch, the shadow below a tree, a pedestrian street. This does not mean that spatial scarcity is limited to the material. It is possible, through its deconstruction in its discursive and distributive aspects, to account for immaterial aspects that constitute scarcity.

In order to explain what this site consists of and its emergent logics, Schatzki introduces the elements that, according to him, compose social life and: "Social life transpires through human activity and is caught in orders of people, artefacts, organisms, and things (Schatzki, 2002:123). The orders he refers to, "the basic layout of matters in that domain, a layout embracing their relations, specifications, and boundaries" give certain order to what otherwise could seem chaotic. The inclusion of these orders, is what starts giving way to the uncovering of certain variables and recurrent issues, some that may be not so explicit, within a context of complexity and constant change. "This broad inclusion of orders within sites allows us to account for the presence and affective capacity of relatively stable objects and practices that continuously draw each other into relation and resurface in social life" (Marston et al., 2005:425). Marston et al, emphasise the importance of a site ontology, in particular when it comes to the built environment, that not only acknowledges socio-materiality but uncovers certain variables: "For example, a site ontology provides the explanatory power to account for the ways that the layout of the Built Environment - a relatively slow-moving collection of objects - can come to function as an ordering force in relation to the practices of humans arranged in conjunction with it" (Marston et al. 2005:425). This is helpful because it provides a certain order, it recognises it happens in a specific milieu that no matter how chaotic it may seem it does unfold through a certain order dictated its components (people, orders, practices). The spatiality of it emerges from it and is part of it. Is not possible to predetermine what a space looks like or what it is, without describing how it is composed and how it unfolds.

With regards to social change, Schatzki focuses on 'prefiguration', or "the ways the social present channels forthcoming action" and agency, or "that through which the mesh of practices and orders is continuously taking place and frequently mutating. (Schatzki, 2002:189). In a social site, and in similar line as relational approaches like assemblage and actor-network theory, this agency is both human and non-human. Nonetheless, he puts further emphasis to *human* agency by including 'practices' or human activity, as an element, on a par with people and artefacts. He makes reference to the need to explain the importance of human agency, especially when having an agenda of social justice and dealing directly with issues of a political nature. (Schatzki 2002:193)

This emphasis of Schatzki, firstly, on sites emerging from the interaction between human and non-human components, and secondly on human agency, relates to scarcity and socio-spatial change, because it departs from the human experience of scarcity and their actions vis a vis this condition.

(b) Constructed Scarcity: scarcity as a relational, distributive, and discursive reality (How scarcity is constructed in the built environment)

Delanda argues for the need to conceptualise social processes beyond the micro-macro: "In order to give a complete explanation of a social process taking place at a given scale, we need to elucidate not only macro-micro mechanisms through which a whole provides its components parts with constraints and resources, placing limitations on what they can do while enabling novel performances" (Delanda 2006:34). This is congruent with the previous chapter that outlines scarcity as socio-material but also discursive and distributive. In the same line, the description of 'the actual' spatial scarcity, will not be defined solely by the immediate account of experienced scarcity, but also by the linkages of this site of scarcity to the discursive and distributive aspects that arise from it, which can be located at multiple scales and may be related to multiple processes.

2.3.2 ASSEMBLAGE THEORY, SCARCITY AND THE SPACE OF THE POTENTIAL IN THE BUILT ENVIRONMENT

In this section, assemblage theory is conceptualised as an analytical tool, to start rendering visible the processes through which scarcity is reinforced or opens the possibilities for change.

As mentioned in the previous section, the main critique to assemblage thinking has been the danger of remaining on a descriptive level and not engaging with a critical analysis that offers a better understanding of change, and a critical engagement with processes of urbanisation. In this line, this

section argues for the potential of assemblage thinking in working as an analytical tool by rendering visible the mechanism behind the processes that allow change to happen or that enforce a particular condition.

For this purpose, this research will develop this analytical thinking by engaging with the following terms, as conceptualised within Assemblage Theory:

- (a) Territorialisation of scarcity (How scarcity continues to be reinforced in a specific site)
- (b) Deterritorialisation of scarcity (How scarcity gives way to a threshold where creativity and change can take place)

It has been established now, that assemblage is concerned with unveiling the mechanisms of emergence operating in a specific scale and in relation to others. Schatzki argues that by studying the segments and lines within the present, that is, their functioning in any given domain, it is possible to inform mediation and provoke intervention (Schatzki, 2002). In the case of spatial scarcity, this research will aim to illustrate the (de)territorialisation of scarcity by firstly, uncovering the relation between the socio-material components in any given site of scarcity and their subsequent analysis with regards to the discursive and distributive aspects of the given condition (the actual). Secondly, it will analyse the different practices and the path of distributed agency across scales, to identify the barriers and possibilities that facilitate the reinforcement of the condition or that hold a potential for change.

Delanda (2005) and Schatzki (2002) both maintain that complex systems generate both systemic ordering and open, creative events. For this purpose it is necessary to identify 'the zone of potentiality' where creativity or change *can* take place.

2.3.3 CONCLUSION: TOWARD AN ASSEMBLAGE APPROACH TO SCARCITY AND CREATIVITY IN THE BUILT ENVIRONMENT

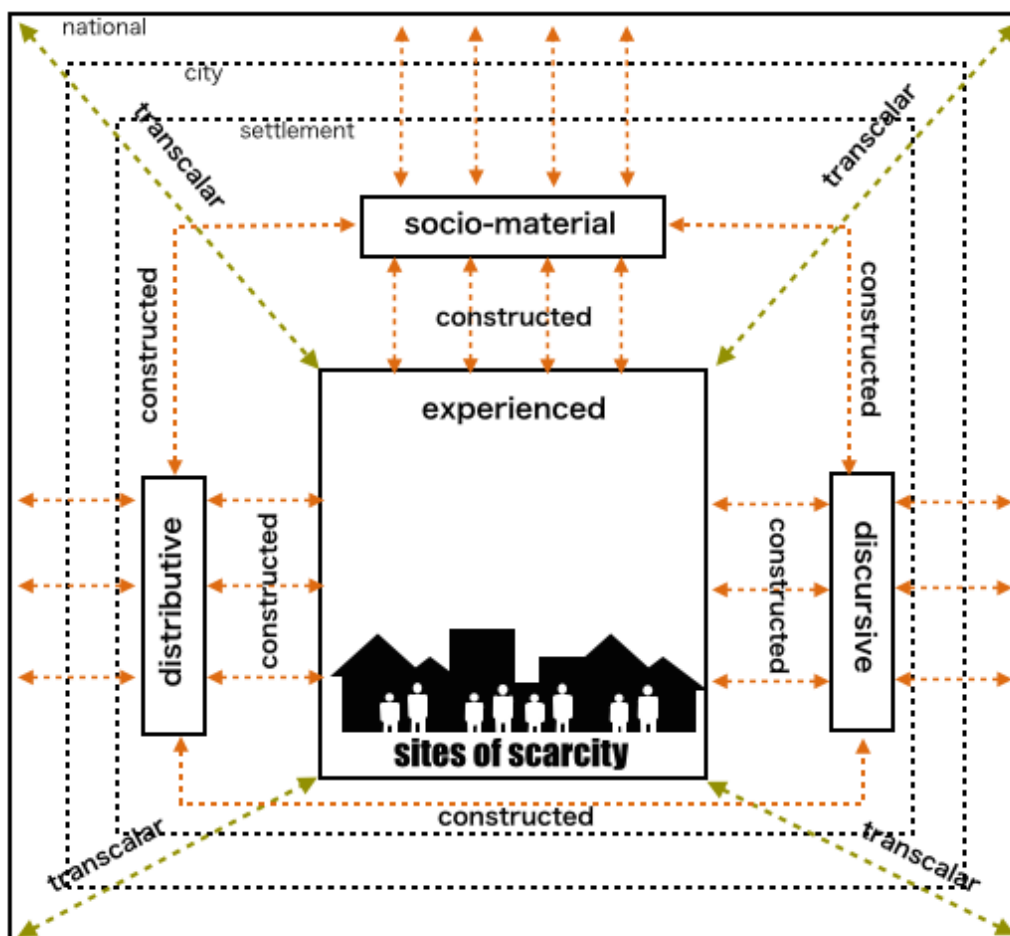
Firstly, scarcity as constructed requires the navigation through scales, but in the case of this research, it departs from the experience of residents using an ethnographic approach, as suggested by the literature in previous chapters. Therefore, the study departs from the experience of scarcity, framed in specific sites that act as repositories where that experience unfolds and takes place. Using the

concept of 'sites of scarcity' allows the grounding of the analysis in the realm of space, without delegating it only to material characteristics. It provides a starting point for exploration and analysis, and it avoids falling into realms that may be out of the scope of this research (i.e. health, economic).

Although the analysis departs from subjective experiences, and is grounded in 'materially identifiable' sites, its subsequent analyses ensures that all aspects are explored in order to focus on the '**how**' (how it functions and who and what is involved) and not on the '**what**' (the site per se, or the narrative initially articulated). It does so by addressing the three characteristics of constructed scarcity identified in the previous chapter: discursive, distributive and socio-material.

The following chapter will deconstruct this theoretical framework into a methodological approach to analyse scarcity and creativity in the two case studies explored in this research.

Fig. 2.2 Diagram illustrating the theoretical framework based on an assemblage approach to scarcity and creativity



This chapter will address the methodological approach to understanding the constitution of scarcity in the built environment. It will do this based on the theoretical premises outlined in the previous chapters, whereas a) informal settlements are explored as particular scenarios, departing from the thorough exploration of socio-spatial phenomena associated to acute conditions of scarcity and the interventions it elicits, b) scarcity is explored as a constructed and transcalar condition, and c) assemblage theory is utilised as a theoretical and practical tool to understand the multiple linkages across micro and macro scenarios of scarcity.

The first section of the chapter will address two complementary methodological approaches. Firstly, the methods for the exploration of everyday life in informal settlements, based on a postcolonial approach in which knowledge is built around (and departs from) everyday narratives of scarcity by the residents themselves. Secondly, this section will argue for the use of operational diagrams as a useful method for the application of an assemblage approach into the deconstruction of scarcity.

The second section will deconstruct step by step the process of utilising a diagrammatical approach to analyse the data and draw findings about the constitution of scarcity and the potential of interventions under these conditions. The result will be a theoretical and methodological template to apply in the subsequent case studies explored in chapters IV and V.

PART I. UNDERSTANDING THE CONSTRUCTION OF SCARCITY IN THE BUILT ENVIRONMENT

3.1 CAPTURING EVERYDAY STORIES OF SCARCITY IN THE BUILT ENVIRONMENT

Previously, this thesis discussed the different ways informal settlements have been theorised or addressed in urban and architectural studies. Relevant lessons emerged from this, particularly the need to avoid the reinforcement of negative or positive stereotypes that only result in detrimental interventions. Instead, it is crucial to explore and reveal the often complex, ephemeral and invisible mechanisms behind the everyday challenges and actions of residents in informal settlements, especially those beyond survival strategies (Varley, 2010:8, Simone, 2010:333, McFarlane 2009). This

is particularly useful in this exploratory study, as the findings from the literature review revealed, there was no background that examined the perception and experiences of scarcity in informal settlements, specifically those of a spatial nature.

On the one hand, dealing with everyday life phenomena related to scarcity is deeply related to methods used in social science, including “a whole range of issues to do with human action, social institutions and their mutual connections” (Giddens 1987:VII) and requires a methodology that allows for an understanding of the quotidian -seemingly mundane - events to unpack them and uncover their relevance for the creation of new theories and empirical approaches.

On the other hand, making use of only surveys and mainstream qualitative methods may result in situations where deprivation and poverty may obscure built environment aspects of scarcity, in favour of aspects that may appear as priority or more important in everyday survival. As a researcher and first visitor to an informal settlement, particularly a very deprived one (See chapter IV), acts of deliberation, engagement, creativity and ingenuity may not be clear or apparent at the beginning, and easily can lead to misinterpretations or a construction of knowledge based on own preconceptions of what scarcity is (very obvious open drainage, bad quality of the housing etc).

For this purpose, apart from using a qualitative approach, this research tried to build knowledge around everyday experiences of scarcity as articulated by the residents themselves. To make this possible, primary methods were of a participatory nature, with a postcolonial approach that emphasises the construction of knowledge (McEwan, 2009), especially of the realities that escapes or differs vastly from conventional western-centred literature on cities and space.

The next section explains the different methods utilised during the fieldwork undertaken in neighbourhoods in Nairobi, Kenya and Quito, Ecuador.

3.1.1 STORIES OF SCARCITY IN THEIR OWN TERMS: PHOTO-VOICE EXERCISES

It was my intention not to force or impose my own perceptions of what could be considered scarcity in the built environment in the context of a seemingly very deprived neighbourhood. For this purpose, I made use of photo-voice tools, trying as much as possible not to influence by introducing preconceived ideas of what scarcity is in informal settlements. Photo-voice is a method that enables people to “reflect on photographs that mirror the everyday social and political realities that influence their lives” (Wang et al., 1998:80). This method allows the articulation of an issue from the resident’s perspective, by not only enabling them to express through concrete visual images but also by reflecting on and interpreting them as well. The latter aspects are crucial in the postcolonial approach of the fieldwork, as it makes emphasis on the construction of knowledge through the articulation and reflection that emerges from the residents’ own experience, the challenges they encounter and the priorities and motivations behind everyday actions.

Through the use of disposable cameras, residents were asked to record their daily life for a period of 7-10 days (to include labour and leisure activities as well as weekdays and weekends), specifically those aspects that convey a lack or a difficulty they encounter in relation to their home and neighbourhood environment. Instructions remained not too specific nor vague. It was important not to dictate or influence the resident and give him/her only a certain guidance.



Fig. 3.1 Residents of Mashimoni discussing their photographs during the second stage of the photo-voice exercise

For the second stage of the exercise, I scheduled in-depth interviews with the residents to discuss the photos they took and the reason behind their choice. Pictures were placed on tables or on the floor for residents to look at them for the first time. It was important to not have time constraints, in order to allow them enough time to contemplate the photos, remember their thinking in that moment and reflect on what they wanted to express with the photograph. Interviews were long and detailed, except in a few exceptions where the interview took place in public areas or busy corridors.

In this case, I did several follow-up visits to clarify or explore deeper into unclear aspects of their stories.

After the initial detailed observation of their own photos, I started the conversation by asking them to choose the most important photo for them, the one that represents the most pressing scarcity they experience in their daily life. In this same manner, they chose the remaining photos in order of priority. With this it was possible to start identifying patterns within a cluster and the village. In parallel, residents were asked to indicate the location where the photo was taken in a map of the village. Many of the photos addressed the same issue, hence were repeated, however, their location changed in the map, and in some cases also the time of day, which allowed for other patterns to emerge.

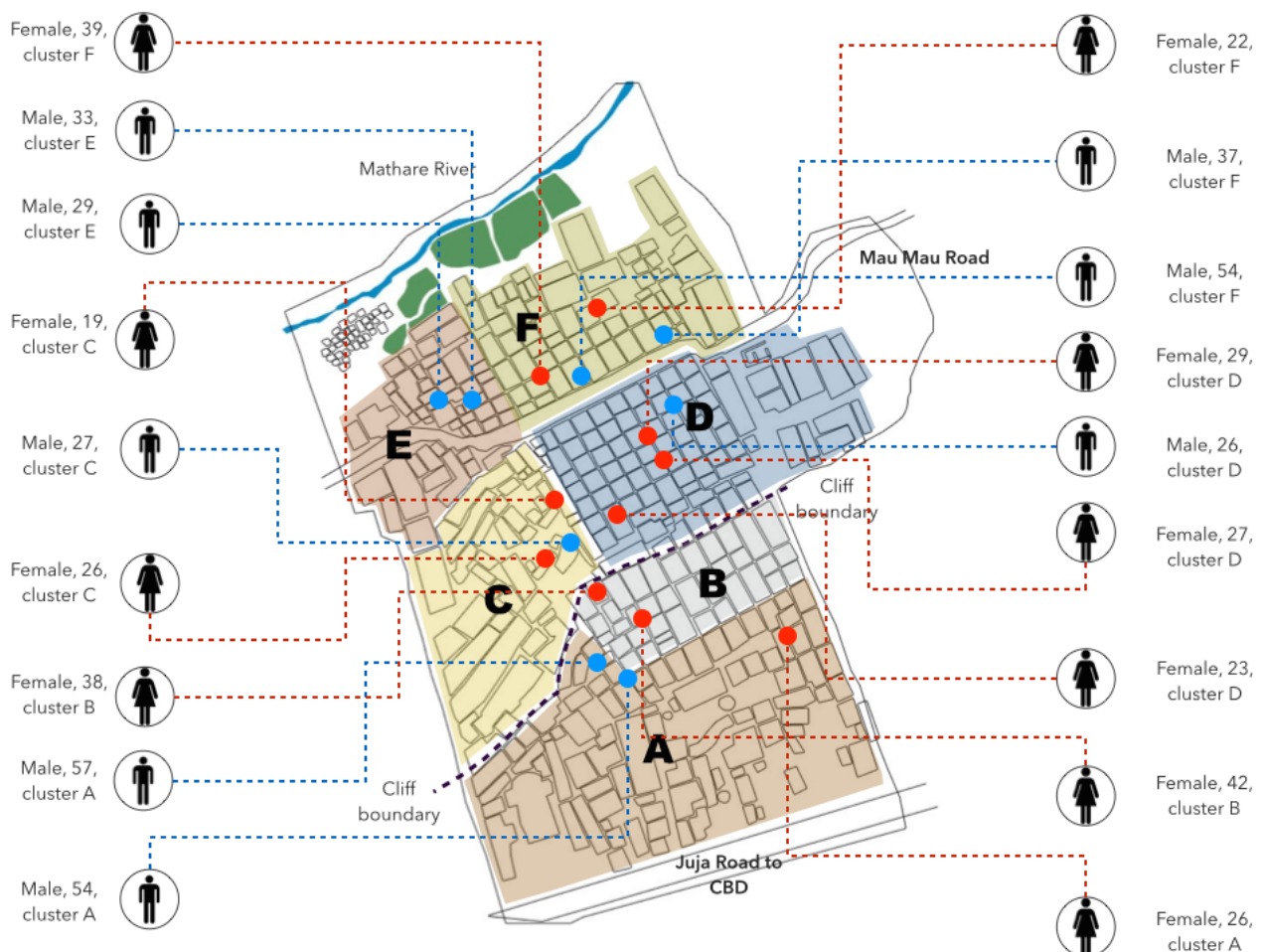


Fig. 3.2 Selected participants of the photo-voice exercise in Mashimoni, Kenya and their geographical location within the village according to clusters.



Fig. 3.3 Residents of Atucucho telling the stories of the consolidation of their neighbourhood and their own houses

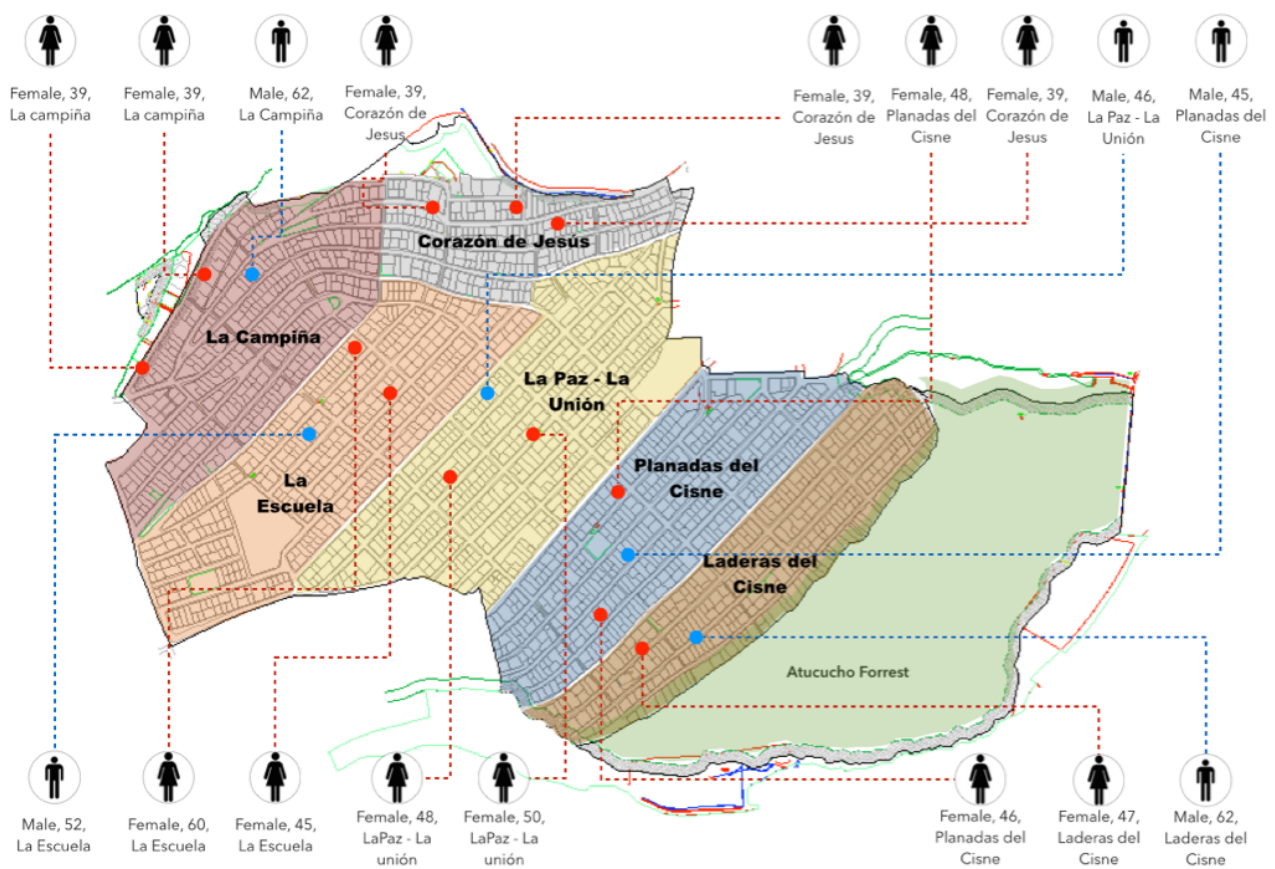


Fig. 3.4 Selected participants for the transect walks and in-depth interviews in Atucucho, Ecuador and their geographical location within the settlement according to sectors

3.1.2 FROM EVERYDAY STORIES TO MULTI-SCALAR ENQUIRIES: FURTHER IN-DEPTH INTERVIEWS WITH OTHER ACTORS AND PARTICIPANT OBSERVATION

The research departed from the lived experienced of the residents, in order to subsequently follow leads into different actors, sites and processes connected to the initial scarcity, jumping from one scale to the other, depending on the processes being mapped. Hence, what started as a detailed

ethnographic study with residents, then evolved into a multi-scalar, rhizomatic approach posed a significant challenge when trying to uncover and understand the linkages between different realms, mainly the micro and the macro.

For this purpose, the methodology evolved from a site-specific ethnographic study based on participatory methods with a postcolonial approach, towards a multi-sited ethnography. The latter is a method that focuses on exploring a specific issue through the collection of data across different sites and groups and that stresses a more thorough engagement with multiple relations and transnational processes (Marcus 1995, Coleman and Hellerman, 2011). Using multi-sited ethnography is in its nature dynamic and contingent, requiring the use of and adaptation of different methods according to the situations arising, hence the flexibility of a 'preplanned or opportunistic tracing of a specific enquiry. From this point onwards, methods used included further semi-structured interviews and participant observation with community based organisations, including youth and women's groups dealing with waste management, sanitation and urban agriculture, savings and entrepreneurship, and other grassroots organisations dealing with mapping and political advocacy. Furthermore, I conducted semi-structured interviews with other relevant actors spanning across civil society organisations, academia, government and development agencies. Once I started undertaking interviews with other relevant actors outside of the neighbourhood boundaries, I began attending meetings, including the formulation workshop for the new national urban development policy, a collaborative workshop on land issues organised by the UN, and a collaborative design workshop to discuss alternatives for the neighbourhood.

3.1.3 FROM CAPTURING EXPERIENCES OF SCARCITY TO A DIAGRAMMATIC APPROACH

The fieldwork undertaken through the methods outlined previously, revealed complex and multilayered data, reminiscent of life, change and contingency in informal settlements. But the fieldwork also made clear the fluidity of linkages beyond the neighbourhood to other sites, actors and processes, required a systematic tool that can analyse the information thoroughly (type of issues) and at the same time, present it in a way that the linkages between them are revealed and remain clear (multiple interactions across scales).

In order to start drawing these linkages and exploring their multilayered dimensions, this research utilised analytical diagrams based on an assemblage approach. The following section will argue the

relevance of a diagrammatic approach to both the study of scarcity in the built environment and to the assemblage approach argued in the previous chapter.

3.2 A CASE FOR A DIAGRAMMATIC APPROACH IN THE STUDY OF SCARCITY IN THE BUILT ENVIRONMENT

This section will argue how diagrams can be useful to study the construction of scarcity in the built environment of informal settlements. It will do so by exploring how diagrams have been used and theorised in urban and architectural studies, and by identifying how their visual, projective and analytical nature can address key aspects (including its limitations) of the assemblage approach and the nature of the data collected during the fieldwork.

A diagram by definition is a visual instrument, “an illustrative figure which, without representing the exact appearance of an object, gives an outline or general scheme of it, so as to exhibit the shape and relations of its various parts” (OED online, 2013). It has the power to delineate the form or workings of a specific matter or topic and the capacity to define relations between elements. While this definition automatically establishes linkages between diagrams and the assemblage approach, this research argues its relevance goes beyond the delineation of forms and relations. This section will elaborate on the latter by exploring how a diagrammatic approach can address the limitations attributed to assemblage thinking when studying scarcity in informal settlements, and by examining how the qualities of a diagram as a visual instrument can help elicit findings on current and possible interventions under conditions of scarcity.

3.2.1 WHAT A DIAGRAM CAN DO FOR AN ASSEMBLAGE APPROACH TO SCARCITY IN THE BUILT ENVIRONMENT - ADDRESSING LIMITATIONS OF ASSEMBLAGE THINKING

As stated in the previous chapter, the potential limitations of applying an assemblage approach to place-based and urban issues like scarcity in the built environment, include reductive conceptions of change and the lack of engagement with politics, capital and wider processes. Diagrams have been used before to address complexity and hybridity in cities through the juxtaposition of layers and simultaneous presence of differential actors and materials (See Alexander, 1964 and Shane 2010). This visual, simultaneous and multilayered representation of urban elements and connections in space and time, is a quality that offers the possibility to address the dangers of reductive conceptions of change. Using diagrams as a way to visualise a complex situation, the totality or the

big picture of it, is a way to maintain a connection (that is crucial) between the 'smallness' and the 'bigness' of the constitution of scarcity. This is relevant to the examination of scarcity as 'site-based assemblages' that contain everyday phenomena in relation to wider and interconnected assemblages or 'wholes'. Furthermore, this visualisation as a whole, with multiple layers of information and use is also congruent with the fluidity of the fieldwork approach, as well as the data that emerged from it. In this sense, the diagram has the graphical quality (connections, hierarchy and layers) to permit a view of several juxtaposed processes, emphasising complexity without losing grip of the grounded stories from which the research departed. This relevance is also theorised by García in his study of diagrams in architecture:

Its relevance for today's problematic: The increasing speed of change and complexity of the planet, its cities and the kinds of activity humanity is more and more engaging in, will create new kinds of qualitatively and quantitatively different problems. These will become bigger and more complex, requiring new kind of global, multidisciplinary systems of innovation and design. But they will need to be solved by a combination of an overall view and ever increasing levels of precision and control at decreasing levels of size. Smallness is becoming the key to resolving the problems of bigness. Architectural and urban problems will require integration and engagement with larger regional and global, more long-term and long-range problems and conditions, and 'spine'-like, distributed, immaterial, invisible systems of experience and service design. (García, 2010:312)

Nonetheless, Shane warns of the limitation of diagrams as inevitably reductive, with the capacity to visualise key aspects and not the totality, of urban complexity (Shane in García, 2010:87). In contrast, and in line with the assemblage approach, Deleuze theorises the diagram as an abstract machine that "creates history by unmaking preceding realities and significations, setting up so many points of emergence or creativity, of unexpected conjunctures, of improbable continuums" (Deleuze, 2006:43). Therefore, the diagrams can be used not as static realities or summaries of the truth, but as deconstructive maps of relations, spatiotemporal elements, loose ends and gaps that shows you the operational aspect of a situation and potentially a route to change through new inputs and contestation. In the same line, Knoespel (2001), when addressing Deleuze's discussions on diagrams and cognitive processes, refers to their capacity to offer visual representations of potential change, by firstly providing a certain order to a fluid process (i.e. in the case of this research to give order to something that we capture and try to decipher), to then destabilising it again in search of possibilities (i.e. through analysis and juxtaposition of interventions). These two processes, giving stability and

destabilising, are also congruent with the territorialisation and deterritorialisation processes discussed in Ch. II.

In the previous chapter, it was argued that assemblage thinking gives emphasis to the agency of the material and of people, considering the material as something more than the background or container of social unfolding. Moreover, it gives the material an active participation in the shaping of urban life and inequality in the city (Swanton, 2011:344). This distributed agency across human and material elements of space and built environment is also addressed through the visual analysis of relations and forces that the diagram can offer. One of the very apparent and first aspects to emerge from the fieldwork was the multiplicity of actors and physical elements interacting in fluid and dynamic ways. Personal stories evolved into issues with multiple relations, some more material (an exposed electric wire initiating a fire in the rooftop when in contact with water) and others less tangible and more complex like power (illegal energy provision imposed and controlled by gangs, themselves allied with local authorities). The deconstruction of issues in the simultaneous graphical illustration of these elements and the juxtaposition of layers that can illustrate relations regarding a specific scarcity can offer a map of how distributed agency operates.

3.2.2 WHAT A DIAGRAM CAN DO FOR THE CRITICAL STUDY OF CURRENT AND POTENTIAL INTERVENTIONS UNDER CONDITIONS OF SCARCITY

The graphical qualities that can make the diagram an operational tool to reveal the workings of scarcity in the built environment, from the micro to the macro complexities of the context, have been described above. However, for the diagram to be used as a map for potential interventions and critical analysis of tactics and creativity, there needs to be an emphasis on its reading as analysis and source of critical thinking. This implies not only using the diagram to “uncover latent structures of organisation” (Eisenman, 2011: 94) but also to “construct a real that is yet to come, a new type of reality” (Deleuze and Guattari, 1987:142). In a way, what a diagram can do, is not only to show how it gets constructed but also how we read and manipulate it.

In this line, this research intends to use a diagrammatic approach that enables different readings through the use of graphical representation (i.e. elements, connections, barriers, loose ends, priorities), multiple layers and juxtaposition of scenarios. With this approach it will aim to address the territorialisation of scarcity (how scarcity continues to be reinforced in a specific site) and the

deterritorialisation of scarcity (How scarcity gives way to a threshold where creativity and change can take place). Moreover, by using spatial scales as a background to situate the graphical elements and layers, it addresses the difficulties of indefinite openness discussed in the previous chapter (see section 2.4.2) by providing a template that offers some limits without overriding other potential and emerging spatial categories (For an example, see Sengupta and Iossifova, 2012).

3.3 CONCLUSION

This part of the chapter discussed the relevance of the diagram based on its capacity to address the potential limitations of the assemblage approach when studying the constitution of scarcity. By showing this process of deconstruction, the diagram can fulfil its operational purpose: it shows the immediate effects of scarcity on people, according to their views, it then helps you understand that there is more to the immediate effects and that several aspects come into place to make those effects happen. However, once you can graphically show these aspects, in parallel to the experience, you can trace connections more clearly and reconsider and reanalyse the initial scarcity. This graphical nature is also more flexible, allowing you to test, explore possibilities and how this, can change everyday immediate aspects or change larger processes: how many small-scale interventions need to be done, how and where, in order to slowly influence an actor or a policy, overcome a barrier and so on.

The next section will deconstruct step by step the process of utilising a diagrammatical approach to analyse the data and draw findings about the constitution of scarcity and the potential of interventions under these conditions. The result will be a theoretical and methodological template to apply in the subsequent case studies explored in chapters IV and V.

PART II. CONSTRUCTING THE DIAGRAMMATICAL APPROACH TO SCARCITY

3.4 CONSTRUCTING AND UNDERSTANDING THE DIAGRAM: FROM EXPERIENCED TOWARDS CONSTRUCTED SCARCITY

This section will illustrate the application of assemblage theory and its diagrammatic approach through an example of experienced scarcity, based on the fieldwork undertaken in Nairobi, Kenya (see Chapter IV). Each of the sections will explain how each part of the diagram is constructed and applied to a real case scenario. The final section will be dedicated to the illustration of how to read the diagram, in order to facilitate its application in the subsequent chapters that address the construction of scarcity in informal settlements in Kenya and Ecuador.

3.4.1 STEP 1 | *FROM EVERYDAY NARRATIVES TO SITES OF EXPERIENCED SCARCITY*

The diagrams depart, as explained in the previous chapter, from the everyday experience of inhabitants, and how they articulated 'scarcity' in their daily lives, affecting their home and neighbourhood environments. In the same line, the methodological approach, was focused on developing a picture through the voices of the inhabitants that experience the scarcity in question, therefore every account of experienced scarcity starts with a personal narrative of everyday life. These personal narratives were captured in the context of this research through observations, photo voice techniques, in-depth interviews with selected informants, and mapping exercises. Subsequently, through the analysis, the fieldwork data became the foundation for the start of the diagram.

Daily life narratives are constituted by people, actions and events interacting with each other, and taking place in specific sites that act as receptacles for this narratives to unfold. For example, by discussing their lack of a basic kitchen space inside their homes, women construct a narrative that takes them from discussing their inside space in their home (from the actual lack of space and inability to transform it, to the lack of appropriate ventilation and precarious building materials and techniques etc) to the dangerous and precarious conditions of the corridors where most of their cooking needs to take place (overcrowding, sewage trenches, lack of lighting). The most basic 'lack' can take us from the intimate realm of a home to discussing the spatial layout and density of a whole neighbourhood. Through the initial analysis of these narratives, these sites are identified and captured as key starting points to deconstruct an experienced scarcity.

(a) A case of scarcity in the built environment: the lack of adequate laundry spaces, Mashimoni, Kenya.

This account of scarcity is grounded in the village of Mashimoni, located in the informal settlement of Mathare, the second biggest of its kind in Nairobi, Kenya. From a vantage point, Mashimoni forms a tight-knitted landscape of houses, arranged row after row and cut-across by narrow corridors that at times become barely discernible. Mashimoni sits over a cliff edge, which creates a distinct divide between the lower and upper area. All the open sewerage runs through the alleyways down the slope to the river, which marks the northern boundary of the village. The top of the site (Juja Road) is almost 20m higher than the river, and the cliff itself -next to one of the few open spaces in the area- creates an 8m high boundary between bottom and top.

The photo elicitation exercises and the in-depth interviews with the residents, offered a window into everyday life in Mashimoni. As expected, due to the high density present in the neighbourhood, many of the issues they encountered is related to the lack of, and competition for space, in order to undertake basic every day tasks related to their house chores or to social activities.

For example, due to the lack of space inside their houses, residents, particularly women, are forced to build small platforms made out of timber directly above the sewage as a way to extend their living space. Furthermore, when it comes to doing their laundry, an activity that requires substantially more space and specific environmental conditions (ventilation and sun, for example) residents expressed a constant battle to adapt the narrow corridors in front of their houses or compete for any available empty space or unallocated piece of land. Some of them resort to using stairs or rooftops as drying decks, which in itself carries a great risk of damage or loss of clothes, and in the worst case, electrocution or fires due to precarious electrical connections.

For some residents, laundry is part of their livelihood, as they operate laundry businesses from their own houses. In this case, they manage to adapt their living space to store clothes and iron them. However, when it comes to the drying process, they struggle to find available and adequate areas that won't carry the risk of loosing or damaging their clients' clothing.

Further constraints come from the qualities of the few available open spaces. Corridors are narrow, highly transited and in all cases, double as sewage trenches. Furthermore, any piece of land that becomes available is immediately appropriated in one way or another, particularly as temporary dumpsites. This means laundry activities tend to be accompanied by inadequate and polluted spaces that bring risks to both people and their clothes.

The following is an example of quotes emerging from photo voice and semi-structured interviews, discussing lack of appropriate laundry spaces inside their homes, whether for personal or business purposes:

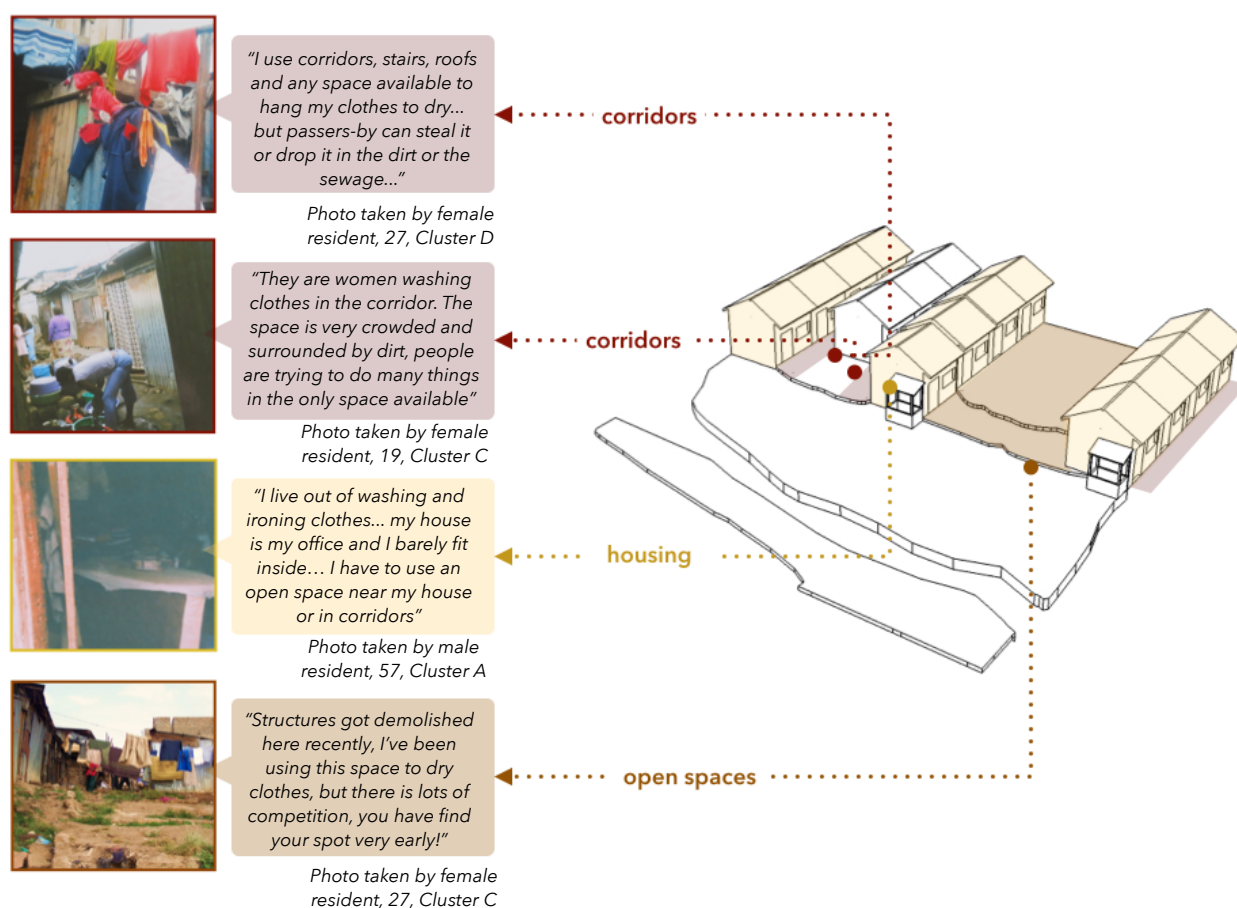


Fig. 3.5 Lack of adequate washing spaces - sites where this condition is experienced and personal narratives



Fig. 3.6 **Step 1:** Identifying the sites of scarcity based on everyday narratives

3.4.2 STEP 2 | UNDERSTANDING THE SITES: ELEMENTS AND INTERACTIONS

From the narratives of experienced scarcity and the first identification of the sites where this scarcity unfolds, we start building a picture of constructed scarcity. We know the sites where initially this scarcity is experienced, but now it is important to understand how that experience is composed in each of those specific sites. At first, each site is analysed on its own and always in relation to the scarcity in question (i.e. lack of laundry spaces) to later start analysing how those sites interact with each other to construct scarcity.

a) Identifying the elements: people, objects and activities

Elements are all of those entities that are interacting within a site of scarcity, and that contribute in one way or another, to the experience of scarcity in question. Elements can be any that compose the socio-material aspect of scarcity.



People: *who is experiencing and/or contributing to the scarcity in question in this site?* These elements surely will include the individuals (i.e. housewives, business owners etc.) that experience the scarcity and that built the initial narratives. But they can also include other people that come in interaction within the site and that, in one way or another, contribute to the experience of scarcity in question. These people can be passers-by, neighbours, structure owners and so on.



Objects: What material elements (objects or organisms) that constitute this site are contributing to the experience of the scarcity in question?



Activities: What activities are taking place in this site that compose or contribute to the scarcity in question?

From answering these simple questions, we get the different elements that are in place and that constitute a specific site where scarcity is being experienced. The figures below show the progression in the deconstruction of each site:





Table 3.1. Step 2 Understanding the sites - Identifying the elements in the dwelling site			
Sites of experienced scarcity identified	What and who? elements interacting everyday		
	People  <i>Who is experiencing and/or contributing to the scarcity in question in this site?</i>	Objects/organisms  <i>What material components or organisms are being part of or contributing to the scarcity in question in this site?</i>	Activities  <i>What activities are taking place in this site that compose or contribute to the scarcity in question?</i>
Housing 	Tenant/resident All the interviewees were currently renting their dwelling, with financial, social and physical constraints to modify it or improve it. Structure owner Structure owners provide no contract or guarantee to their tenants, and do not invest on or improve the structures.	Internal space In each of the cases, the internal dwelling space was insufficient and characterised by poor ventilation and little or no lighting, making it physically impossible to undertake any laundry activities inside the house.	Daily house activities Other daily activities (cooking, sleeping, resting) already overtake the space inside the house

Table 3.2. **Step 2 | Understanding the sites** - Identifying the elements in the corridors









Sites of experienced scarcity identified	What and who? <i>elements interacting everyday</i>		
	People  <i>Who is experiencing and/or contributing to the scarcity in question in this site?</i>	Objects/organisms  <i>What material components or organisms are being part of or contributing to the scarcity in question in this site?</i>	Activities  <i>What activities are taking place in this site that compose or contribute to the scarcity in question?</i>
Corridors 	Tenant/resident <p>The majority of the residents utilise the corridors to wash and dry the clothes. This clashes with other home chores like cooking and washing dishes, making the corridors overcrowded at specific times.</p> Passers-by <p>Passers-by can be residents or strangers looking for quicker access to different areas of the neighbourhood or as a short-cut between Juja road (main road) and Mau Mau Road (transversal road across Mathare). They are in constantly in contact with drying clothes, making the soiled or in some cases stealing them.</p>	Internal space <p>The insufficiency within the internal space of the houses, means that laundry activities spill-over to the corridor</p> Corrugated roof tops <p>These are used occasionally to dry clothes and are in close proximity to each other due to the narrow space between houses. Roof tops are also often in contact with the live wires of the illegal electricity connections.</p> Open sewage <p>Laundry activities have to take place above open sewages as corridors often double as sewage trenches.</p> Dirt paths <p>All the internal corridors are made out of dirt paths and occasionally of timber platforms that partially protect from the sewage.</p> Dwellings <p>The extreme density and competition of space within the neighbourhood means that houses are generally only separated by a small front corridor (1.00m aprox) with no space for horizontal expansion.</p> Lighting <p>There is no lighting in corridors, making it difficult to undertake home chores at night and increasing the risk of damage and stealing of clothes.</p> Water	Home chores <p>Other daily chores (cooking, washing dishes, bathing) also takes place in the corridors, making it overcrowded at specific times.</p>

Table 3.3. **Step 2 | Understanding the sites** - Identifying the elements in the vacant spaces

Sites of experienced scarcity identified	What and who? elements interacting everyday		
	People  <i>Who is experiencing and/or contributing to the scarcity in question in this site?</i>	Objects/organisms  <i>What material components or organisms are being part of or contributing to the scarcity in question in this site?</i>	Activities  <i>What activities are taking place in this site that compose or contribute to the scarcity in question?</i>
Dwellings 	Tenant/resident <p>Some of the interviewees resort to using any space that becomes available, even if just temporary. This use can be of an opportunistic nature or organised through word of mouth.</p> Passers-by <p>Vacant spaces, whether permanent or temporary become short cuts and preferred routes for passers-by, both from and outside the neighbourhood.</p> Temporary users <p>Vacant spaces, whether permanent or temporary become appropriated by people quickly for other different activities, including playing, socialising, washing, or even as temporary dumpsites.</p>	Vacant land <p>Spaces become available in Mashimoni spontaneously, through the dismantling of structures, fires, or simply, they remain unallocated due to the fluidity of ownership and agreements between structure owners and authorities.</p> Clothes <p>Clothes in vacant spaces benefit from better access to ventilation and sun, but are subject to being damaged or stolen.</p> Sewage/ Garbage <p>Vacant areas are usually in proximity to sewage trenches and are quickly appropriated as temporary dumpsites.</p>	Home chores <p>Other daily chores (cooking, washing dishes, bathing) also takes place in the corridors, making it overcrowded at specific times.</p>

b) Analysing relations between elements: material, contextual, social, political, personal and temporal

Chapter I and II, addressed how scarcity in the built environment has many dimensions, beyond the commonly perceived aspect of 'material', including how a resource is distributed and controlled. In this section, the theoretical framework and the diagrammatic approach will dissect how, within a site of experienced scarcity, different relations come into place to create a specific condition that affects humans and the built environment. These relations refer to the three aspects that define scarcity, according to theoretical framework, *discursive*, *distributive* and *socio-material*, and by using them as

analytical categories, they will help elicit findings departing from everyday empirical data but progressing into a critical view of scarcity as *constructed*.

Based on this, relations can be **material, contextual, political, personal attributes, social, and temporal**. These relations aim to represent different ways in which objects, people and activities relate to each other, and that therefore create a specific situation that impedes the person to have access or control over a specific resource or aspiration.



Material

Material is perhaps the more straightforward relation, considering that the research discusses specifically the built environment. It refers to different aspects involving material elements, including the actual lack of such element, its poor quality, or its detrimental effect in the person's life. During the fieldwork, a resident's everyday narrative often included a material lack of a resource, such as money or construction materials to fix or expand their houses or infrastructure. This category also emerged when discussing the poor quality of building materials, components of a house or its internal disposition; the precariousness of the sewage system or illegal electrical connections, the actual lack of a dumping site; the lack of in-house toilets or poor quality of communal facilities. In the context of the informal settlements discussed in this research, material relations can also mean the actual lack of space, due to high density and overcrowding within the neighbourhood, a typical characteristic of informal settlements where competition for space is rife.



Contextual

A contextual relation refers to specific characteristics or attributes of the place, associated with the scarcity in question. This differs from material in the sense that its context-specific, less abstract and more rooted in certain place-based characteristics that cannot be found anywhere else. An example can be topography or weather events.



Political

A political relation is related to the distributional and discursive aspect of scarcity. It refers to issues of access, influence and control over resources. This category is influenced by Nussbaum's notion of freedom and deprivation, particularly her reference to "control over one's environment" (Nussbaum, 2000). This refers to the ability to influence the processes that governs one's life, including those

related to material aspects that constitute the everyday environment you inhabit, like housing, land and infrastructure. From some of the accounts and narratives of residents, it emerged that what they describe as a lack, was carefully related to different constraints imposed in the way they use and manage a specific resource. An example can be the relation between housing, tenants and structure owners. In this case, tenants find themselves in a disadvantage position, where paying a monthly rent for their house and inhabiting it, does not mean they can manage it in a way that improves their life. Furthermore, political relation also refers to the mechanisms that allow you to participate in decision-making processes and that enables you to negotiate options for a better life.



Personal attributes

Personal attributes are related to the skills, knowledge, motivation and confidence to act as agent in the improvement of one's life. This aspect became apparent in the narratives during the fieldwork, particularly as constraints arising from personal circumstances, that impede a person to operate or makes the person operate in a negative way, even when money, materials or opportunities were available. An example can be the lack of awareness of hygienic practices or knowledge of how to operate devices, even when the material resources exist. It can also refer to lack of confidence to intervene in a space that seems disregarded by others but is full of potential, even when resources to transform it are available.



Temporal
















A temporal relation refers to the time rhythms, schedules, or seasons that govern everyday life in the settlement and that are part of the scarcity analysed. This can refer to the incidence of a specific event that affects residents, such as the clogging of open drainage during peak hours, the flooding of the riverside every rainy season or the rearrangement of the internal space during the night.



Social

The social relation refers to issues arising from human interaction that govern the experience and construction of a scarcity in the built environment. This relation also refers back to discussions in chapter I, that addressed the relation between solidarity, social action, trust and connections for common purposes and their relation to scarcity.

If we go back to the example in question, and focus on the components within the housing site, the corridors and the vacant land, we can observe the following relations that arise and the processes of analysing begins:

Table 3.4. Step 2 Understanding the sites - Analysing relations between element at the housing site							
Elements	Type of relation						Borders
	Material 	Political 	Social 	Personal attributes 	Contextual qualities 	Temporal 	
Structure owner & Resident  	No stable income and fluctuating (non regulated) rents and informal arrangements	Constant threat of eviction No influence on structure owner Competition for structures		Lack of knowledge on relevant legal instruments to avoid eviction / mistreatment from landlord			
Internal space & Resident  	No stable income and fluctuating (non regulated) rents makes it almost impossible to invest in major transformation to internal space	Almost no influence (ownership, decision making) on how houses and internal spaces can be done and modified Profit-driven design/building of houses, no regulation on what can be built	Many of the women are single mothers with no relatives/ neighbours/ friends that can assist in modifying/ adapting the internal space	Use of internal space dictated by personal habits, cultural aspects and motivations Many of the residents lack of skills and motivation to invest in the house (no sense of ownership and stability)	High density settlement, complicated topography and constant competition of space, internal space is used at its maximum capacity	Residents constantly re-arrange and adapt internal space at different times of the day	
Daily activities & Resident  	Requirement of specific material objects and types of spaces for each activity		Some daily home chores/ activities are preferred to be undertaken in company of other women, as they provide opportunities for social interaction	Daily activities dictated by personal habits, motivations		The sequence and occurrence of daily activities/ chores are regulated through time rhythms and schedules	














<p>Structure owner & Internal Space</p> 	<p>Structure owners have the resources to invest but don't need to. Demand of houses is high, potential occupiers guaranteed, despite poor conditions of the structure.</p>	<p>ST has the majority of influence (ownership, decision making) on how houses and internal spaces can be done and modified Profit-driven design/building of houses, no regulation on what ST can build</p>			<p>High density settlement, complicated topography and constant competition of space, space is used at its maximum capacity</p>		
<p>Daily activities & Internal Space</p> 	<p>Internal space is insufficient and inadequate for the daily activities undertaken by the family</p>				<p>High density settlement, complicated topography and constant competition of space, internal space is used at its maximum capacity</p>	<p>The use of internal space for daily activities is regulated through time rhythms and schedules (i.e. living room becomes children's room at night)</p>	




Table 3.5 **Step 2 | Understanding the sites** - Analysing relations between element in the corridors

Elements	Type of relation						Borders
	Material 	Political 	Social 	Personal attributes 	Contextual qualities 	Temporal 	
Residents & Internal space	No stable income and fluctuating (non regulated) rents makes it almost impossible to invest in major transformation to internal space	<ul style="list-style-type: none"> - Almost no influence (ownership, decision making) on how houses and internal spaces can be done and modified - No power to ask for improvements or modifications - Profit-driven design/building of houses, no regulation on what can be built 	Many of the women are single mothers with no relatives/ neighbours/ friends that can assist in modifying/ adapting the internal space	<p>Use of internal space dictated by personal habits, cultural aspects and motivations</p> <p>Many of the residents lack of skills and motivation to invest in the house (no sense of ownership and stability)</p>	High density settlement, complicated topography and constant competition of space, internal space is used at its maximum capacity		↔
Residents & Sewage	Residents undertake laundry activities on top of the sewage, becoming exposed to diseases	Residents have little influence on adapting sewage systems or how the sewage is used/managed. Sewage crosses in front of every house in Mashimoni, residents cannot escape its effects	Residents have little influence on adapting sewage systems or how the sewage crosses in front of every house in Mashimoni.		High density makes corridors double as open sewage systems, hence located in front of each house	Open sewage becomes clogged at evening times, causing flooding and smells and making it difficult to undertake laundry activities in the corridor in the evening	↔
Laundry & sewage	Clothes come in contact with open sewage at the corridors, causing damage and loss				High density makes corridors double as open sewage systems, hence increasing the possibility of clothes making contact with sewage	Open sewage becomes clogged at evening times, causing flooding and increasing the damage to and loss of clothes in the evenings	↔


Residents & Daily activities	Requirement of specific material objects and types of spaces for each activity		Some daily home chores/ activities are preferred to be undertaken in company of other women, as they provide opportunities for social interaction			The sequence and occurrence of daily activities/ chores are regulated through time rhythms and schedules	↔
Laundry & internal space	Internal space is not enough or adequate to do laundry or store clothes appropriately		Laundry competes with many other daily activities that have to be undertaken within internal space, hence with less priority				↔
Laundry & Passers-by			Many passers-by are unknown to the neighbourhood and do not care if clothes get damaged while they pass	Some Passers-by damage or steal the clothes while passing through corridors	High density and layout of the settlements makes corridors narrow and therefore passers-by usually come in contact with the clothes		↔
Laundry & Lighting	Lack of street lighting facilitates stealing of clothes				The illegal condition of the neighbourhood impedes any provision of street lighting in inner corridors (only in Mau Mau road)	Residents cannot undertake laundry during the evenings	↔
Laundry & rooftops	Clothes get damaged when in contact with the roof, due to rust and dirt in the iron sheets	There is little choice but to use rooftops as drying places, when corridors are too crowded or dirty			High density makes corridors narrow and rooftops are usually used to dry clothes, both for the lack of space and sunlight		↔
Residents & rooftops	Residents are at high risk of electrocution due to exposed electric wires in the rooftop	Illegal provision of electricity is the main and most affordable way of accessing energy, no regulation on the precariousness of it.					↔

Table 3.5 **Step 2 | Understanding the sites** - Analysing relations between element in vacant land

Elements	Type of relation						Borders
	Material 	Political 	Social 	Personal attributes 	Contextual qualities 	Temporal 	
Residents & Vacant land	<p>Vacant land is usually ridden by garbage (as temporary dumpsite) or sewage, hence exposing residents to health risks</p> <p>residents make efficient use of the vacant areas for shared, communal purposes</p>	<p>Residents have some level of freedom when initially appropriating the land that temporally becomes available</p> <p>Power structures exist between individual and groups that appropriate vacant areas (more permanent)</p>	<p>Residents doing laundry share the same difficulties and advice each other once space becomes available</p> <p>Residents make shifts to take care of each others laundry</p> <p>Vacant land is used also as a social space</p>		<p>The unclear allocation of land and precariousness of the settlement make vacant areas unpredictable and prevent any investment on their condition</p> <p>The flexibility and unclear allocation of land, allows residents to make alternative use out of it, once the opportunity arises</p>	<p>vacant land becomes available at different times of the day and often is unpredictable for residents to plan their use</p>	↔
Laundry & Vacant land	<p>Vacant areas provide with enough area, sunlight and ventilation for laundry</p> <p>Vacant land is usually ridden by garbage (as temporary dumpsite) or sewage, hence exposing laundry to damage</p> <p>There is no water connection to facilitate laundry activities</p>				<p>The unclear allocation of land and precariousness of the settlement make vacant areas with no rules and prevent any investment on their condition to be used as laundry spaces</p>		↔

Resident s & Tempora ry users		<p>Power structures exist between individual and groups that appropriate vacant areas</p> <p>Conflict may arise when residents and temporary users clash over use and appropriation of temporary vacant land</p>	<p>Temporary users and residents washing share similar difficulties with the lack of space for their activities</p>			<p>Certain times are more coveted for undertaking chores and socialize, making vacant areas crowded and contested at times</p>	
Resident s & Passers- by	<p>Vacant areas are highly valuable as circulation for passers-by (that try to avoid the intimidating narrow inner-corridors) and for the residents that lack of communal areas and open spaces</p>	<p>Vacant areas are highly contested and sought-after. Conflict between residents and casual passers-by is common, over the use and circulation in the area</p>			<p>The high density of the settlement and unplanned nature, makes more probable that residents and passers-by will enter into conflict of use of space</p>		
Tempora ry users & vacant land	<p>Vacant land is usually ridden by garbage (as temporary dumpsite) or sewage, hence exposing TU to health risks</p> <p>TU make efficient use of the vacant areas for shared, communal purposes</p>	<p>TU have some level of freedom when initially appropriating the land that temporally becomes available</p> <p>Power structures exist between individual and groups that appropriate vacant areas (more permanent)</p>	<p>TU share the same difficulties and advice each other once space becomes available</p> <p>Vacant land is used also as a social space</p>		<p>The unclear allocation of land and precariousness of the settlement make vacant areas unpredictable and prevent any investment on their condition</p> <p>The flexibility and unclear allocation of land, allows residents to make alternative use out of it, once the opportunity arises</p>	<p>vacant land becomes available at different times of the day and often is unpredictable for TU to plan their use</p>	

Passers-by & vacant land					<p>The flexibility of the allocation and appropriation of land in the village, makes feasible alternative circulation paths once the opportunity arises</p> <p>The high density of the settlement and lack of connection with the surroundings make circulation within and across difficult, forcing PB for alternative routes</p>	<p>Circulation patterns vary according to temporal rhythms, time of day, festivities, weather etc.</p>	↔
Laundry & Temporary users	TU get in contact with hanged laundry, occasionally damaging it.			No motivation, awareness or interest in respecting items that get in the way in vacant areas, including laundry	<p>Vacant areas are one of the few open spaces that TU can use for their activities or to socialise, hence coming into frequent contact with laundry</p>		↔
Laundry & passers-by	Passers-by get in contact with hanged laundry, occasionally damaging it.			No motivation, awareness or interest in respecting items that get in the way in vacant areas, including laundry	<p>Vacant areas are one of the few access corridors that passers-by can use to cross the settlement freely, hence coming into frequent contact with laundry</p>		↔

Laundry & sewage/garbage	Vacant areas also double as dumpsites and sewage trenches, occasionally exposing laundry to damage or loss				Lack of official dumpsites, means residents have to use vacant areas for garbage disposal. Due to the geography and layout of the settlement, at least one sewage trench always leads to a vacant area		
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c) Defining the conditions

Using the tables discussed in the previous section, the data is translated into the diagrams at the site level. Each site is analysed in terms of the elements that compose it (as in section a) and the relations between those elements (as in section b). In this line, the assemblage approach and the study of scarcity starts taking shape by deconstructing everyday narratives.

The following diagram (See Fig. 3.7) shows how each site is analysed, using the corridor as example, and how specific conditions start to emerge from the elements and relations. Starting from this, and using simplified figures, an abstraction of the sites is made, where a clear depiction of the elements and the relations between them is made. Using colour codes and symbology, is possible to start seeing specific 'red zones' formed by rigid borders of negative relations or flexible borders of possible or potentially beneficial relations. In this way is possible to start understanding in both a qualitative and spatial way which elements are linked to each other, how they are linked, and which one of these are critical in the scarcity studied.

These conditions are subsequently use in the next steps to start constructing a view of scarcity that is translocal and transcalar.

Fig. 3.7 Example of how experienced conditions of scarcity are analysed in each site

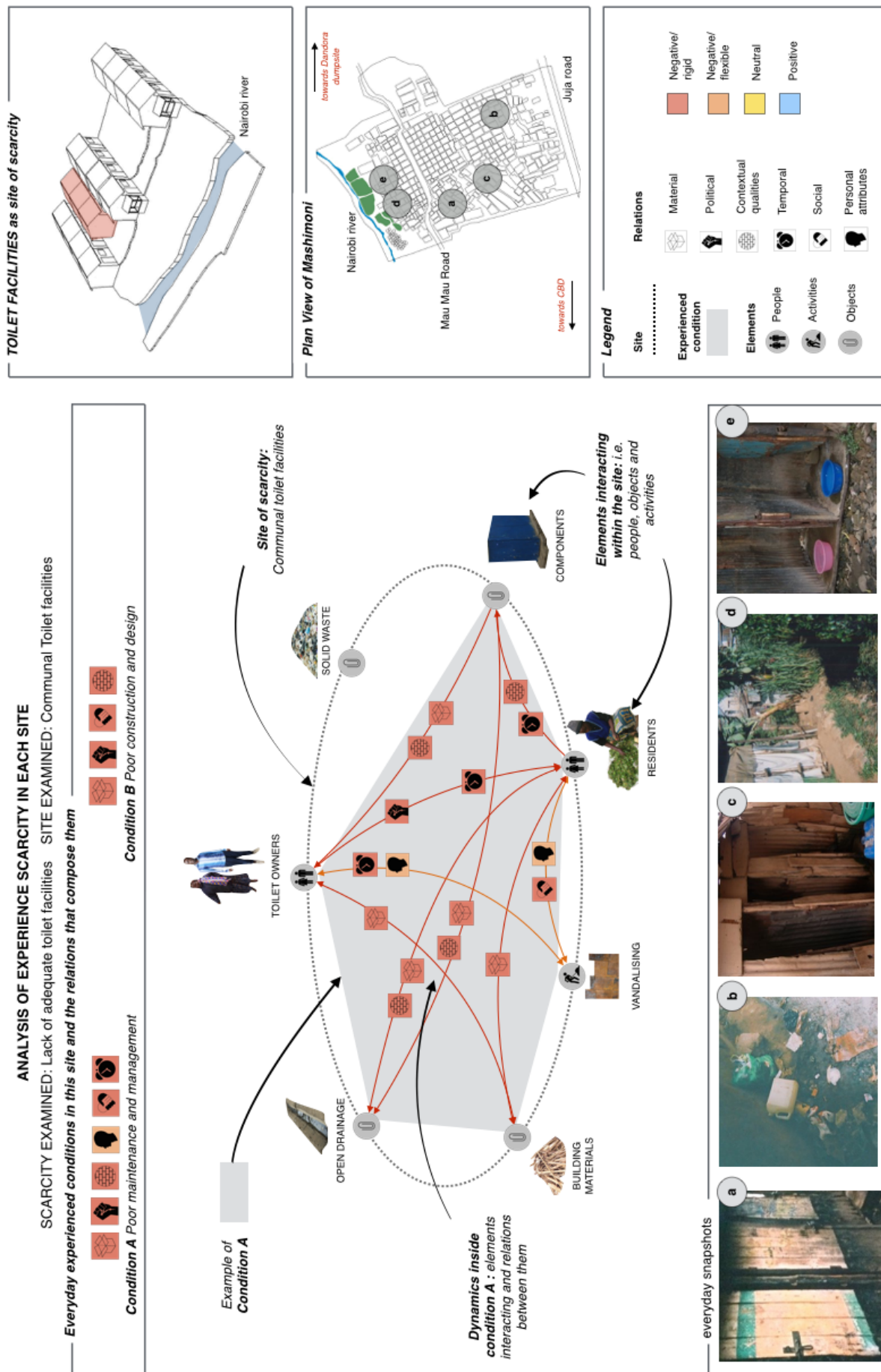
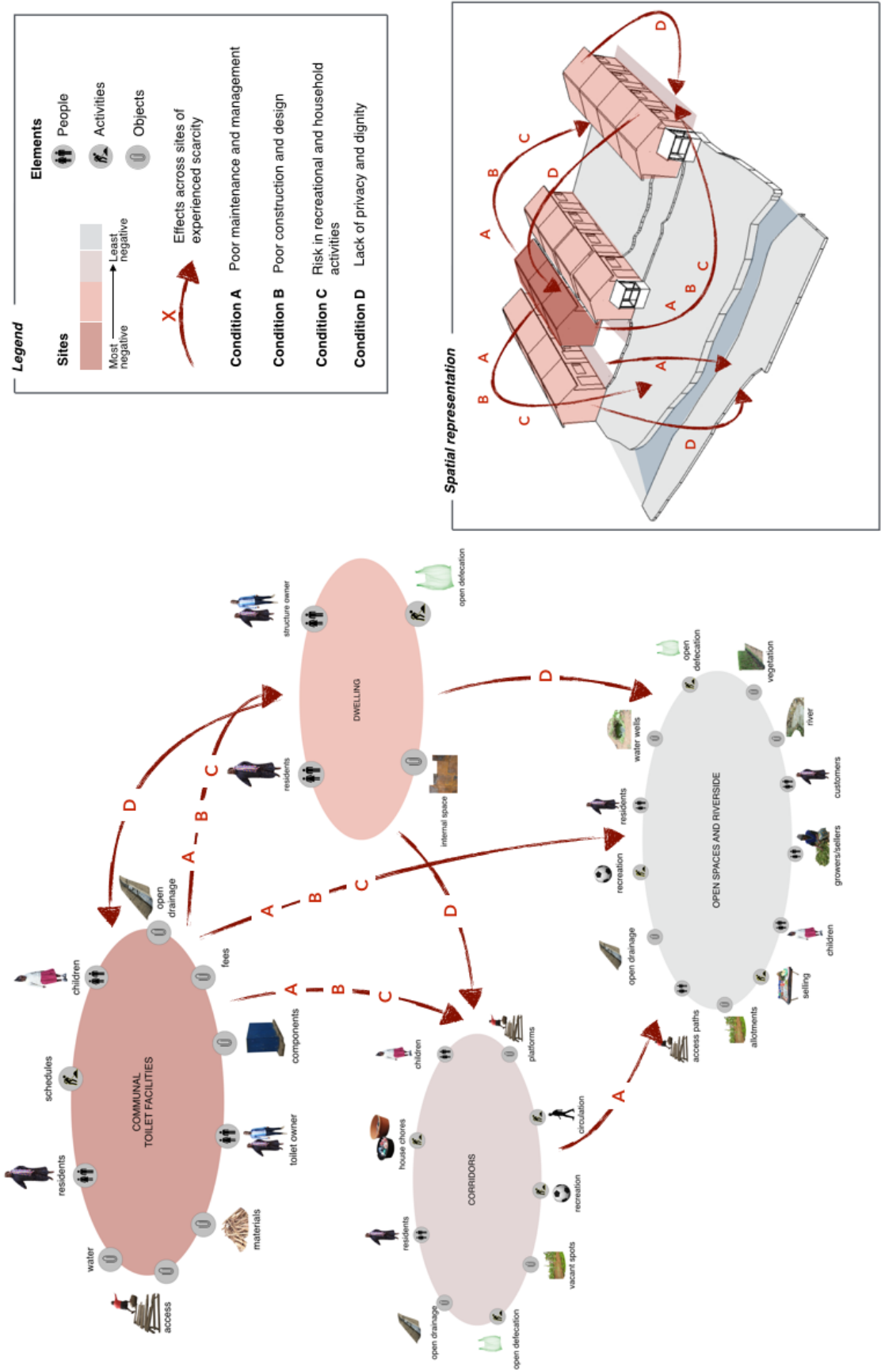


Fig. 3.8 Example of the assemblage of experienced scarcity: Effects of scarcity across sites based on case study I (see section 4.3.3 Lack of adequate toilet facilities)



d) The assemblage of experienced scarcity: Effects of scarcity across sites

After analysing the sites and the conditions arising in each of them, sites are brought together to create a more detailed and integrated picture of how the scarcity in question is experienced. Working with sites in parallel is where the diagram can help us visualise how sites are interrelated, and how they work as an assemblage of scarcity at the local level, exercising pressures between sites. The figure below (See Fig. 3.8) illustrates how to use a simple diagram (it can be a section or a axonometric, depending on the complexity and quantity of the sites), and the information gathered in the tables, as the starting point for the analytical diagramming. As a result, a picture emerges illustrating the most problematic sites at the local level, where the scarcity is first experienced. This information will be useful in the next steps, when it will be to analysed vis-a-vis elements and relations at other scales (the translocal and transcalar assemblage).

3.4.3 STEP 3 | PUTTING THE ASSEMBLAGE TOGETHER: TOWARDS A CONSTRUCTED AND TRANSCALAR READING

With the information arising from further in-depth interviews and analysis of secondary data, it is possible to construct a more detailed articulation and deeper understanding of experienced scarcity that already starts unfolding into a constructed (discursive, socio-material and distributive) and transcalar (who is involved, where are issues been experienced) reading.

This step is the crucial method of this methodology as it will depart from an experienced, grounded situational analysis, towards a constructed understanding, a map of how the condition is related to many different aspects but also a semi-operational map of how that scarcity works, where are the weak points, the problematic areas, the key actors and relations, the positive aspects and the potentialities within. Its a map that can be read from different perspectives, whether this is based on profession, role, interest or scale of intervention.

For this purpose, as shown in figure 3.9, an assemblage of constructed scarcity is built by organising the findings from previous analyses into the template of the diagram, according to scales. The template consist of a space of **experienced scarcity** and a space of **transcalar scarcity**. The former illustrates the analysis of how scarcity is experienced at the local level, including the sites and the conditions that emerge within them, as explained in the previous section. The latter is a space divided according to spatial scales relevant to the case study, for example, village, settlement, city

and national. It is in this space where findings are organised, as well as the linkages between them. These linkages may be at a local level (between clusters, with other villages), but they may also jump into other scales and realms (the city, the main road leading to the City Centre and so on).

Once the findings are placed according to the scales and their linkages, this diagram is used as analytical and operational, in the sense that it becomes an abstraction of the mechanisms of scarcity. It is here where it starts being analysed through two different layers.

a) Layer 1 | *From experienced to constructed scarcity: Translocal and transcalar deconstruction*

As illustrated by Fig. 3.10, this diagram represents constructed scarcity based on its discursive, distributive and socio-material nature. These three aspects are designated by the type of relations mentioned in section 3.4.2: political, social, material, personal attributes, contextual qualities and temporal. In this line, the findings are juxtaposed with the relations that compose them.

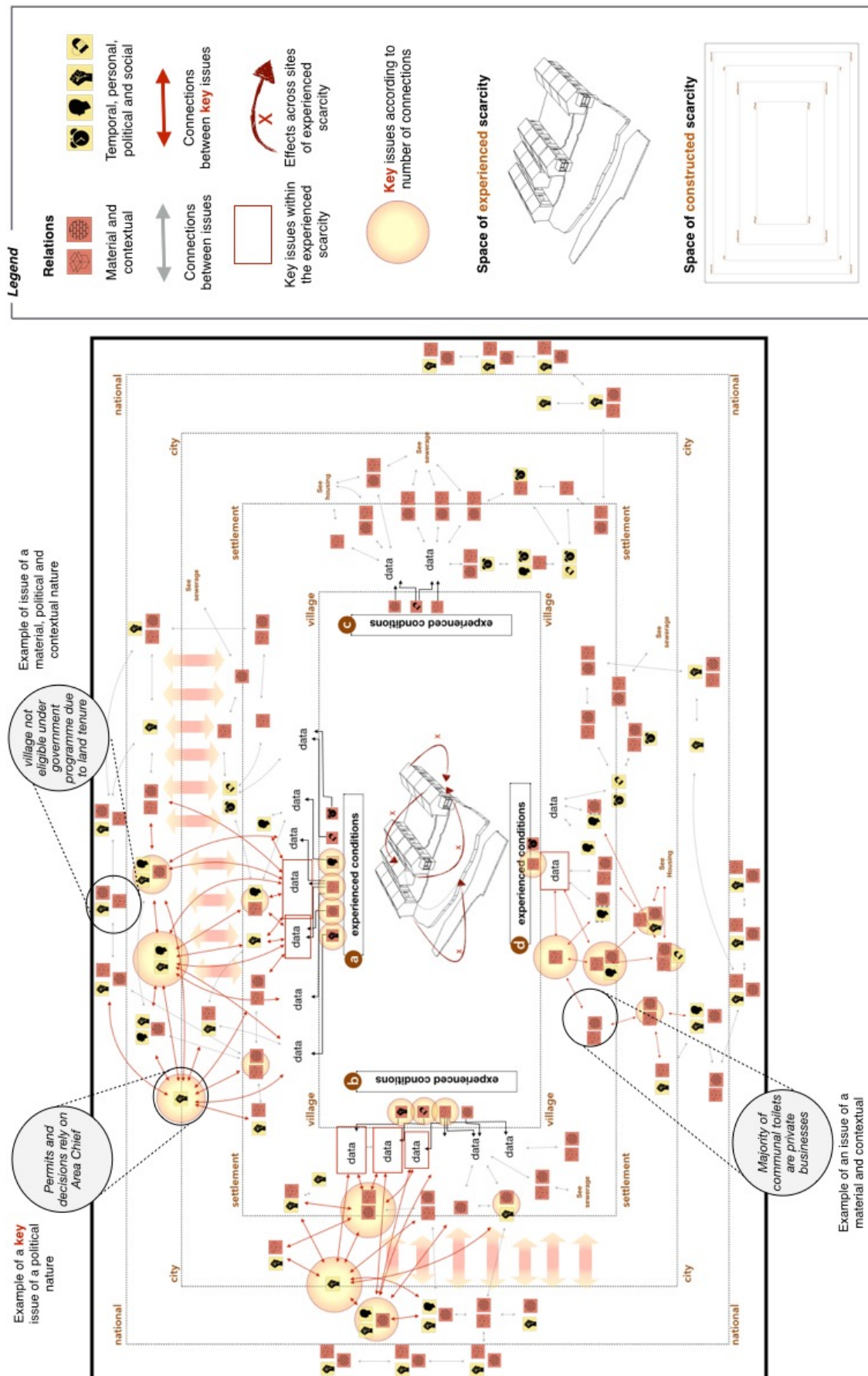
Using this diagram it is possible to observe how conditions and sites at different scales are more affected by specific types of relations. Some issues may be more related to in-site lack of specific knowledge or skills, others may be related to larger scale issues like the geographical position of the settlement, the crossing of a river, an economic relation with a neighbouring settlement, the closeness to a business district and so on. This reading also illustrates the transcalar nature of scarcity. It shows at a glance, how a specific scarcity is related to micro or macro scales in different and at times, very fluid ways.

At this point, it is possible to start identifying the key issues or bottlenecks, which are illustrated according to the number of linkages attached to it. These bottlenecks are also represented in this specific layer, and therefore provide more depth to the analysis of scarcity. It directs the findings towards those most problematic points that play a crucial role in the construction of scarcity. These bottlenecks will be key once the scarcity is analysed vis-a-vis creativity.

PAGE 79



Fig. 3.10 Constructed scarcity Layer 1: Analysis of issues in the translocal and transcalar diagram according to their material, contextual, political, social, personal and temporal nature.

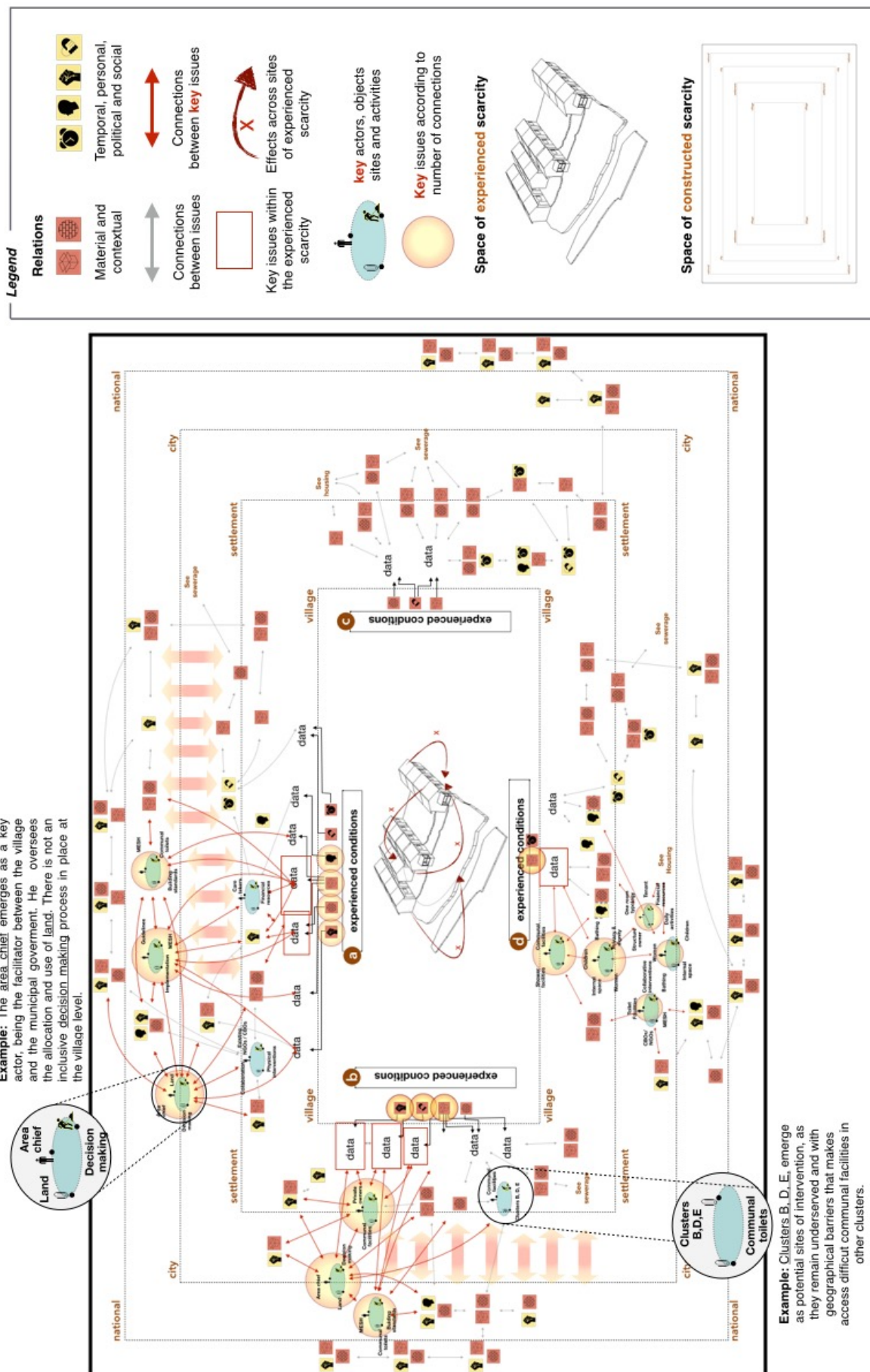


b) Layer 2 | From experienced to constructed scarcity: analysis of key actors, sites and activities (new assemblages)

The second reading of the diagram refers to a more detailed analysis of the bottlenecks (See Fig. 3.11). The latter are treated as new assemblages, composed themselves of new elements, including people, objects and activities. It is here where the assemblage starts giving an idea on how to better address the scarcity in question. Is it mainly a political aspect that needs to be addressed through institutional reform or better policies? Is it a combination of material and contextual aspects where more technical assistance is needed? In this line, bottlenecks with political aspects may give information on key actors and controlled resources, contextual aspects may give information on key sites or spatial components.

Through these two layers, this research will assess how scarcity is constructed in the built environment of each case study, and subsequently it will be used operationally to assess the tactics that emerge from it through the actions of the residents.

Fig. 3.11 Constructed scarcity Layer 2: Analysis of key actors, sites and activities in the translocal and transcalar diagram



3.4.4 STEP 4 | DECONSTRUCTING EMERGING TACTICS UNDER CONDITIONS OF SCARCITY

This section of the methodology will make use of the ethnographic research that captured the current interventions deployed by different actors in relation to specific scarcities. Once an intervention is discovered or articulated in the “capturing narratives” stage, this intervention is decomposed into the categories that emerged from the theoretical framework (see chapter II) and the diagrammatical approach (see previous sections in chapter III). These categories are graphically juxtaposed into the initial diagram of constructed and transcalar scarcity (see Fig. 3.12) in order to identify how the tactic operates within them. This allows us to identify the scope of the intervention and the problematic that it tries to address. Depending on the position within this diagram, we can see if the intervention addresses the immediate effects of scarcity (experienced) or various transcalar and multidimensional issues (constructed), if it is strategic in addressing the main bottlenecks, and if it uses the available resources and opportunities or adds new ones. This process of juxtaposing is what the research previously called ‘deterritorialisation’, meaning, the moment where the tactic intervenes and destabilises a situation of scarcity, for better or for worse.

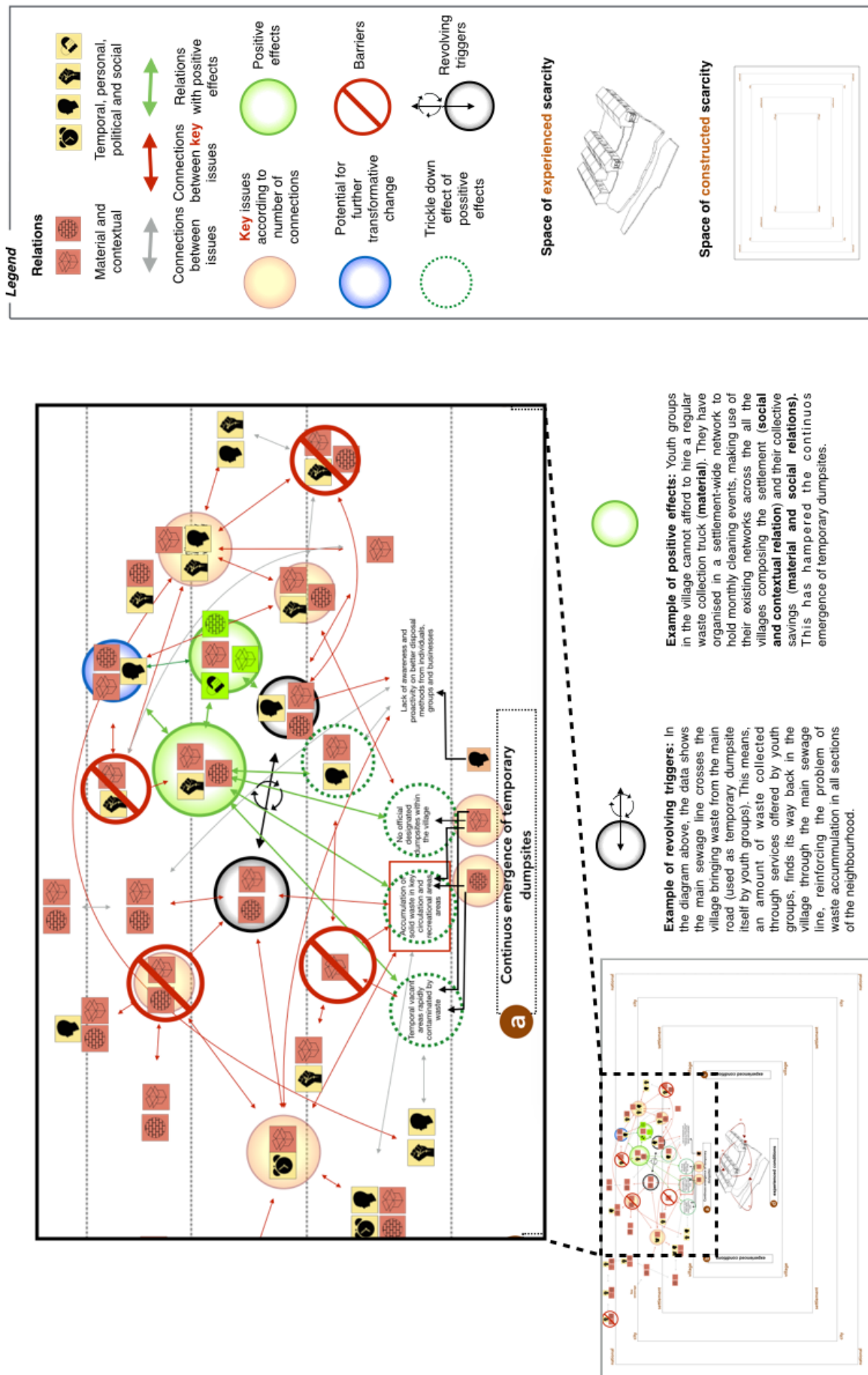
After composing this layer of analysis, the diagram is used to critically assess the emerging tactic (see Fig. 3.12). Here we can start identifying different types of interventions and analysing them more critically, according to the literature review in chapter I. The following categories of tactics emerge from the theoretical framework:

Reactive Tactic: an action that mitigates temporarily the experienced effects of scarcity without altering its core mechanisms, leading to *survival*.

Transformative Tactic: an action that *mitigates* the experienced effects of scarcity by altering one or several core aspects of its mechanisms

Revolving Trigger: an element (person, object, process) that *promotes* the perpetuation of a specific scarcity.

Fig. 3.12 Layer 3 Scarcity vs tactics: Deconstructing emerging tactics under conditions of scarcity



3.5 CONCLUSION

This chapter was concerned with developing a methodological approach that could merge the lessons from the literature review on scarcity, creativity and informal settlements, with the assemblage approach discussed in chapter II. In order to do so, the chapter addressed the use of a postcolonial approach for the ethnographic research in each case study, as well as the use of a diagrammatic approach to better elicit findings on scarcity and creativity from an assemblage perspective.

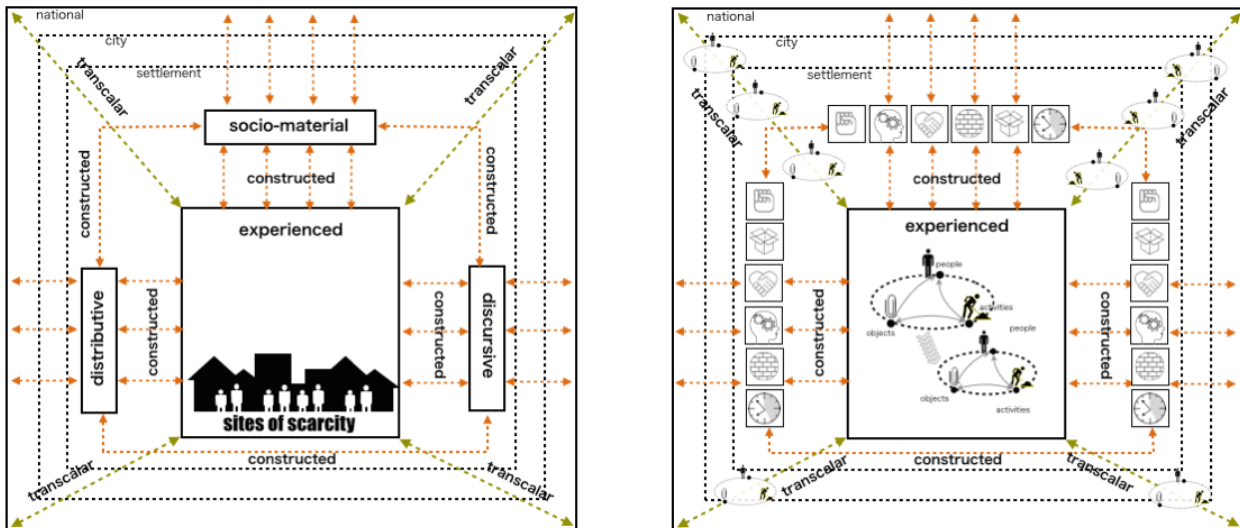


Fig. 3.13 Conceptual framework vs Assemblage and diagrammatic approach | Constructed and Transcalar scarcity

PART I | DECONSTRUCTING SOCIO-SPATIAL DYNAMICS OF SCARCITY IN THE BUILT ENVIRONMENT OF MASHIMONI

4.1 CONSOLIDATION OF INFORMAL SETTLEMENTS IN NAIROBI

This section will address the spatial and institutional developments that influenced the emergence and consolidation of informal settlements in Nairobi, from a historical perspective. For this purpose, it will address the origins of the city based on the 1899 plan for a railway town, which followed western-based planning standards and norms and promoted the appropriation of space without consideration of indigenous land uses. It will also address the subsequent history of segregation policies, land use and informal practices of land tenure that have shaped the current urban composition of the city. Furthermore, this section will dwell on the subsequent responses to the informal in Kenya from government authorities, as well as key facts on the current situation in Nairobi and the challenges emerging from them.

4.1.1 AN OVERVIEW OF THE EMERGENCE OF INFORMAL SETTLEMENTS IN NAIROBI

To understand the current spatial segregation and the place of informal settlements within the city, this section will address the planning and architectural (formal) approaches in Nairobi, in the post-colonial period and beyond the imposition of master plans (that did not include or addressed informal settlements at all) and how these influenced the emergence and consolidation of informality. A set of key regulatory tools with spatial connotations for informal settlements will be discussed.

Nairobi emerged as a railway town, due to its key central location during the inception of the railway connecting East African inner land to the Indian Ocean. This emergence was characterised by western-based approaches to housing and urbanisation, as well as direct approach to spatially segregate the town, by catering mainly to European settlers and Asian workers and subordinates. (See Makachia, 2011).

It is then that the African population find themselves turning into informal means of shelter, located in the peripheries, predominantly in the East lands. This informalisation accelerated with the

consolidation of Nairobi as the city capital of the country and a zoning system that “further enhanced segregation, enclaves and spatial limits to the advantage of European settlers” (Owuor and Mbatia, 2011:121). This early wave of informalisation was further exacerbated by land expropriation to the benefit of the European settlers that pushed rural population into the growing urban centre (Majale, 2000:4).

Particularly relevant to Mathare Valley, is the spatial pattern that emerged from the racial segregation evident in the quality of land appropriated by European settlers and Africans, and which remains tangible until today. This pattern places Europeans in the north and west side of the railway and the African population to the East side, where land is more prone to flooding and health risks (Achola, 2002). Furthermore, there was an explicit purpose of developing the East area of Nairobi as a native or African enclave, that could be part of the city and therefore remain regulated but at the same time be separated enough from the European enclaves. This inclusion however, was mainly spatial, and did not entail any provision of services or shelter and marked the beginnings of informal means of surviving in the city (Hake, 1977).

After independence, this spatial segregation of the city and the informalisation of specific areas continued exponentially, albeit, no longer led by race segregation but by the increase of power amid the economic local elite that started appropriating the most suitable areas and resources in the city (Gatabaki-Kamau and Karirah-Gitau, 2004:159). This situation was later exacerbated by the formulation and attempt at implementing a series of planning strategies which were western-based, functionalist and essentially modernist in their approach and largely ignored the particular needs of a large sector of the population that did not comply with the modernist view of progress (Otiso and Owusu (2008).

Firstly, during the 1960s, planning instruments sought to address the increasing demand for housing through subsidies while clearing unsuitable structures and whole settlements considered slums. Both of these approaches were unsuccessful as the government did not manage to supply enough housing nor control the increasing informal nature of urban growth. Eventually, the focus shifted towards sites-and services schemes (1970s) and tenure regularisation and slum-upgrading programmes (1980s), both of which aimed towards cost-recovery. Nonetheless, the major projects

and programmes emerging from these two decades and approaches proved to be benefiting more middle-income populations.

More recently, a set of key institutional developments have potential important repercussions in the development of informal settlements, including the new Kenyan Constitution, adopted in 2010 and the subsequent and ongoing changes like the Housing bill and Land Use policy. The Kenyan legal system is currently undergoing major changes due to the new constitution and this section will also aim to analyse the opportunities that arise within land and housing aspects for informal settlements like Mashimoni.

The following are the key policies in relation to land, housing and building regulations, relevant to Mashimoni:

Land Policy Draft:

In 2009, a Land Policy Draft was proposed, addressing informal settlements and other vulnerable groups. It was formulated in association with stakeholders from public, private and civil society through regional workshops and thematic groups. In relation to the situation of Mashimoni, it proposed the following opportunities: a legal framework for transference of un-utilised land; and to create a regime of secondary land rights.

The policy, however, is invalid and is in need of re-formulation according to the new constitution. Delays in the passing of this policy underlines the already existing limitations within the policy processes which could be exacerbated through the passing of the new constitution.

The Land Act:

The Land Act also addresses informal settlements. If the residents of Mashimoni wish to own or lease a plot of land, all of Mashimoni's residents need to be represented through a community entity. While this is obviously an opportunity for Mashimoni to secure land rights, the representative group could potentially abuse this recognition and favour themselves or certain members of the community.

Housing Policy Draft Bill:

The housing situation is somewhat similar to the current land situation, though still more undefined. A housing policy draft bill recognises the need for slum upgrading by proposing: building codes; affordable housing; a national housing authority. However, as with the land situation, the policy is in need of re-formulation to fit the new constitution and there is in general a lack of information regarding the future of a potential housing policy. This delays the process and makes any implementation difficult due to a lack of legal frameworks for any slum upgrading.

Physical Planning Act:

Similarly, the Physical Planning Act is still based on a rigid planning scheme, with no acknowledgement of informal settlements and structures that are not in compliance with the current land requirements. On a positive note, it is likely that this will change with the new urban development policy. This is still only in a stage of concept proposal but it suggests bringing more structure to the development of Kenyan cities and proposes the need to address informal settlements and make sure that informal dwellers are informed of relevant policy implications.

Building companies profiting from housing in undefined land, as explained in the previous section, was also common in Mathare, and played a key role in the construction of substantial number of houses, without providing or securing titles, permissions or some sort of tenure for the tenants (see University of Nairobi, 1971). This rapid and profit-driven construction accelerated the building of housing stock in the area and the rapid population growth, without addressing provision of infrastructure and services or the regularisation or even clarification of the land tenure.

4.2 AN INTRODUCTION TO MASHIMONI

4.2.1 CURRENT SITUATION: A LOOK OUTWARDS, LOCATION AND RELATION TO ITS SURROUNDINGS

A key reason behind the consolidation and continued growth and relevance of Mathare, is its convenient and strategic location in relation to the rest of Nairobi. Mathare, having started as a periphery settlement in the 1950s, found itself caught within a sprawling Nairobi, and now is located less than 5km away from the Central Business District, bordered by Thika Road, one of the main transversal roads of the city. Moreover, Mathare is located in close proximity to the bustling neighbourhood of Eastleigh, predominantly inhabited by Somali population, and boasting as a hub

for business and entrepreneurship in the city, which in turn has become a source of casual labour opportunities for residents in Mathare and Mashimoni.

Furthermore, the same aspect that attracts residents to Mathare - its strategic location- also plays a role in its disadvantage, as its central location fuels the competition for rental housing and maintains a profit-driven approach to building houses in the area. This also means rents are usually higher than in other settlements and the demand for housing is always high and therefore, competitive. Higher rents in this case, do not equal better quality of house, as structure owners are known to capitalise on the high demand and feel little or no obligation to invest in the house or in the infrastructure. (World Bank, 2006:35).

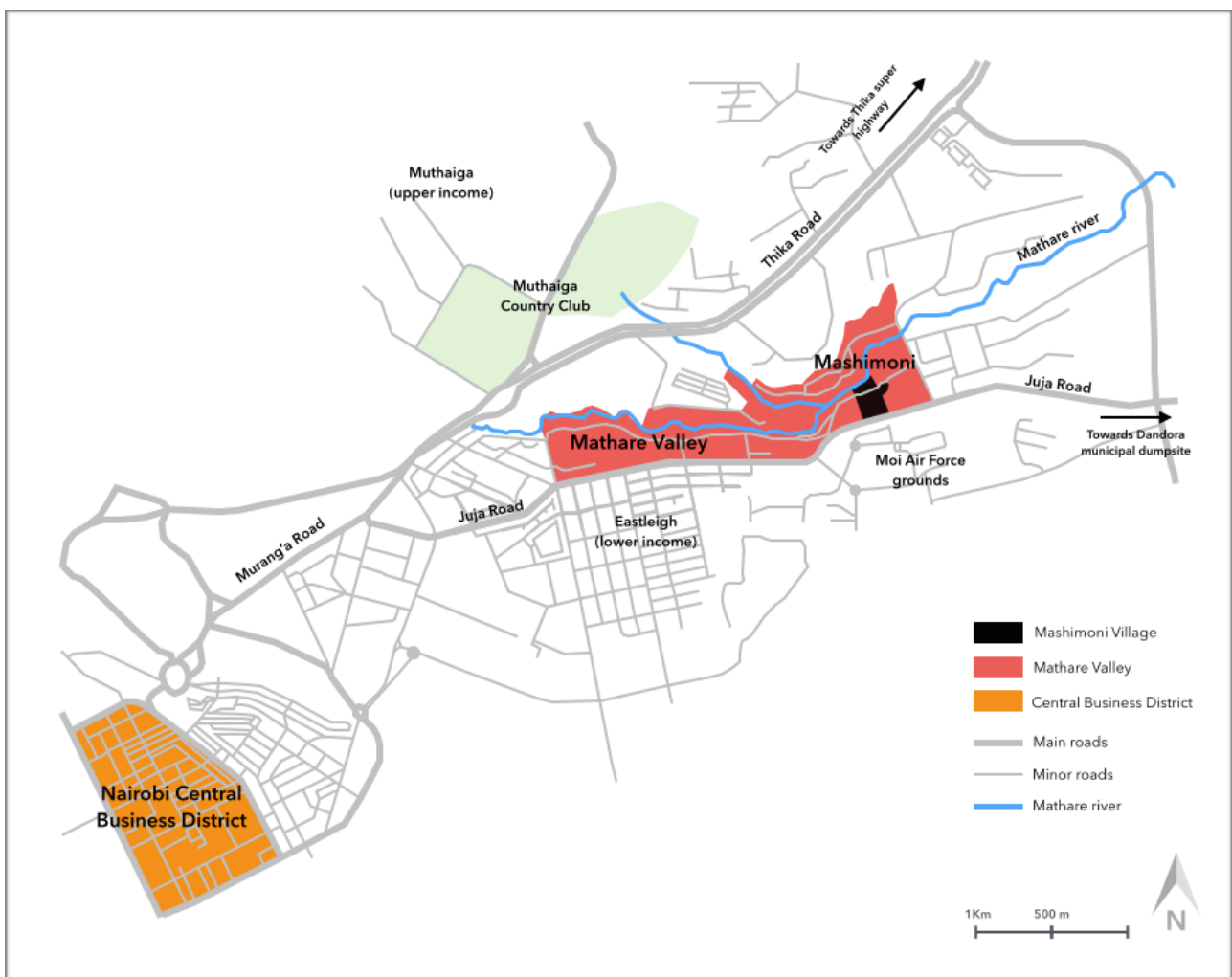
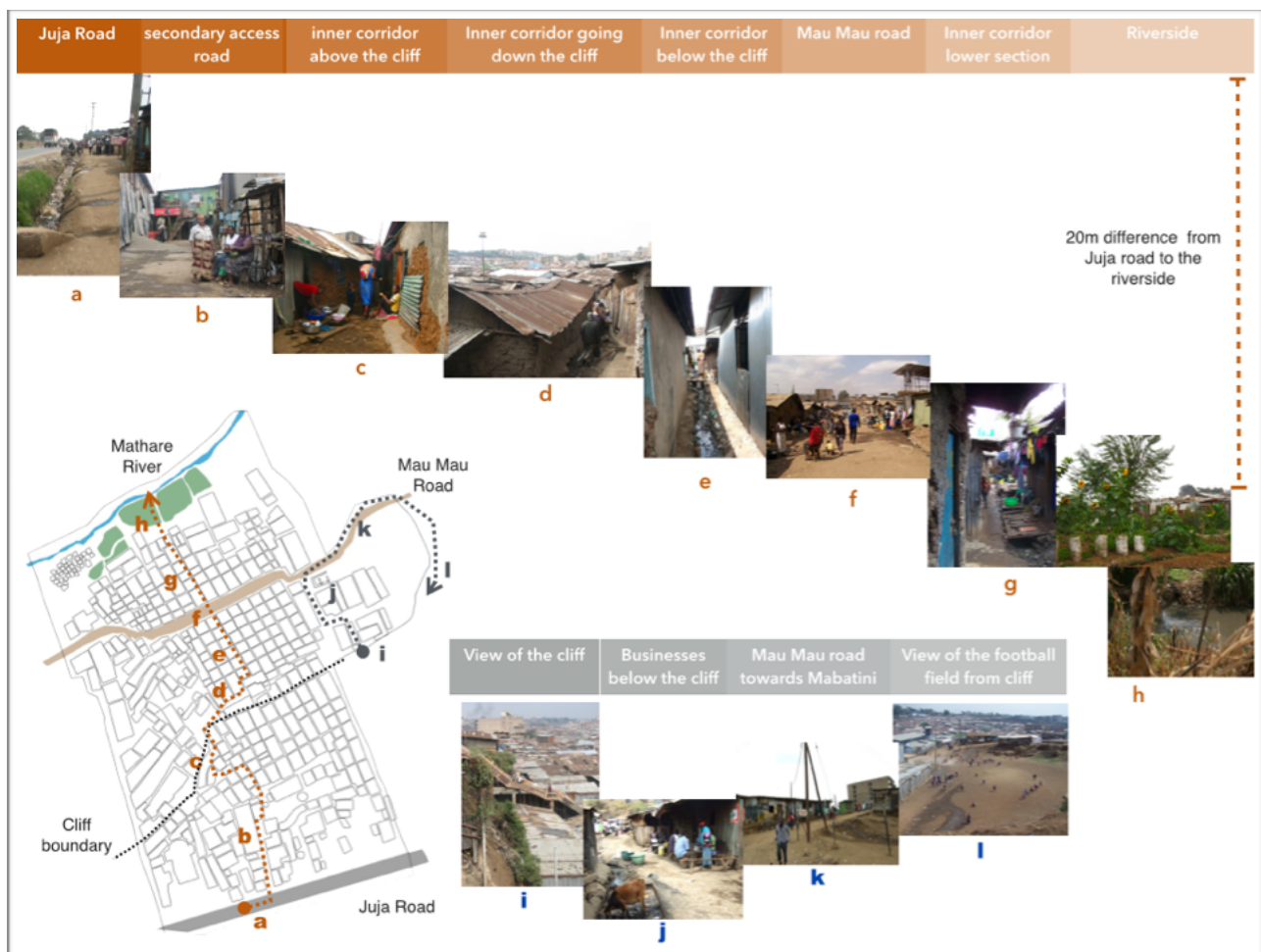


Fig. 4.1 Plan of Nairobi Central Business District and Nairobi Eastlands, including Mathare Valley and Mashimoni Village (Constructed by the author).

4.2.2 CURRENT SITUATION: A LOOK INWARDS, SPATIAL COMPOSITION AND SOCIO-ECONOMIC OVERVIEW

The village of Mashimoni, is located in the informal settlement of Mathare, the second biggest of its kind in Nairobi, Kenya. From a vantage point, Mashimoni forms a tight-knitted landscape of houses, arranged row after row and cut-across by narrow corridors that at times become barely discernible. Mashimoni sits over a cliff edge, which creates a distinct divide between the lower and upper area. All the open sewerage runs through the alleyways down the slope to the river, which marks the northern boundary of the village. The top of the site (Juja Road) is almost 20m higher than the river, and the cliff itself -next to one of the few open spaces in the area- creates an 8m high boundary between bottom and top.

Fig. 4.2 Schematic section of Mashimoni showing the topography of the village



Statistics specific to Mashimoni are scarce, as is the case with many of the subdivisions or villages within informal settlements in Nairobi. According to the 2009 Kenyan Census, Mashimoni has a population of 4,478 inhabitants. There is a strong reliance on casual labour in Mathare, with only 10% of the population involved in formal labour market. Common casual labour activities include clothes washing (usually in Eastleigh or in more affluent neighbourhoods) and construction labour.

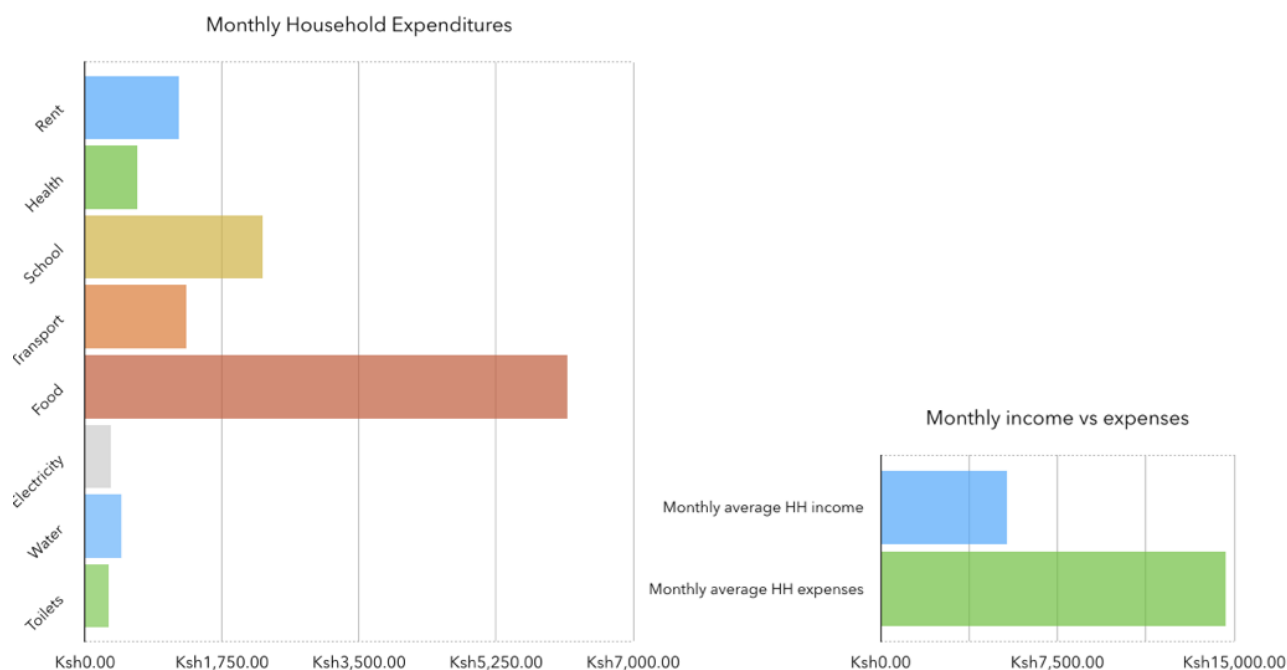


Fig. 4.3 A chart showing average monthly expenditures vs monthly income for a household of tenants in Mashimoni

Furthermore, the informal and unpredictable nature of income-generating activities in Mathare, means that residents live on a make ends meet approach, balancing expenditure according to fluctuating income, which means in most cases, extreme adjustments to health, basic services and food provision.

An average household income in Mashimoni is of Ksh 5,372 in contrast to an average monthly expense of Ksh 14,647 leaving a deficit of more than double the income. Residents usually find themselves in a continuous cycle of debts and unable to save. From this constant negative start, a variety of coping strategies have emerged as a sort of 'safety nets', which will be explained further in the next chapter.

As explained in previous chapters, even within informal settlements, economic and social situations vary substantially between groups or geographical areas. Mashimoni in itself, is in very vulnerable position in comparison with other villages, particularly with regards tenure status, housing conditions and access to water and toilets.

4.3 SOCIO-SPATIAL DYNAMICS OF SCARCITY IN MASHIMONI

This section discusses the analysis of the five main scarcities related to the built environment in Mashimoni, emerging from the everyday narratives of its residents. Each scarcity is discussed according the following structure, based on the diagrammatic approach introduced in chapter III:

- i) An introduction to the subject
- ii) An analysis of how the scarcity is experienced, using the assemblage approach introduced in chapter II and III, including each condition it creates, the sites where the condition unfolds and lastly, its material, contextual, political, social, personal and temporal relations
- iii) An analysis of the scarcity as an assemblage, exploring the conditions and its effects across sites
- iv) An analysis of scarcity as constructed (translocal and transcalar), exploring the key issues and relations
- v) A focused analysis outlining the material and contextual aspects of the assemblage, in order to draw initial lessons for the built environment (key sites, key elements and key actors)

Each section is accompanied by a diagram, as an instrument that facilitates the visualisation of the composition and construction of the scarcity assemblage, and its respective reading at different scales.

4.3.1 LACK OF ADEQUATE SEWERAGE



Fig. 4.4 An overview of the sewerage condition across Mashimoni

Perhaps, it is not surprising that sewage was considered the main scarcity related to the built environment by residents in Mashimoni. Through a quick initial visit and observation, the lack or poor condition of sewerage is evident and tangible in every space of the neighbourhood (See Fig. 4.4). Drainage is commonly open, carrying sewage from as far as the Air Force grounds across Juja Road, running down hill across the settlement and finally draining into the Mathare river (see Fig 4.5). In this trajectory across the settlement, open drainage are in direct contact with inner corridors, front of houses, open spaces, main roads, schools, churches and the riverside, leaving residents with no other choice but to be exposed to sewage.

Through the fieldwork it became clear that women are particularly affected by the sewage, as they frequently use and appropriate the internal corridors -through which the sewage usually runs through- for various home and social activities, including washing clothes, cooking and chatting with neighbours. For example, due to the lack of space inside their houses, women are forced to build small platforms made out of timber directly above the open drainage as a way to extend their living space. It is here where food preparation, cooking and washing usually takes place, hence these range of daily activities are always accompanied by flies, running sewage and the odour coming from the open trenches. This precarious situation poses a serious threat to the health of the women using these spaces and their families, significantly reducing their quality of life. The issues with open sewage also varies according to seasons. While in the dry season, women said to be affected by flies and odours coming from the open drainage; the wet season brings the risk of flooding, which usually occurs when trenches gets clogged by water streams and solid waste and the sewage spills into the neighbouring houses.

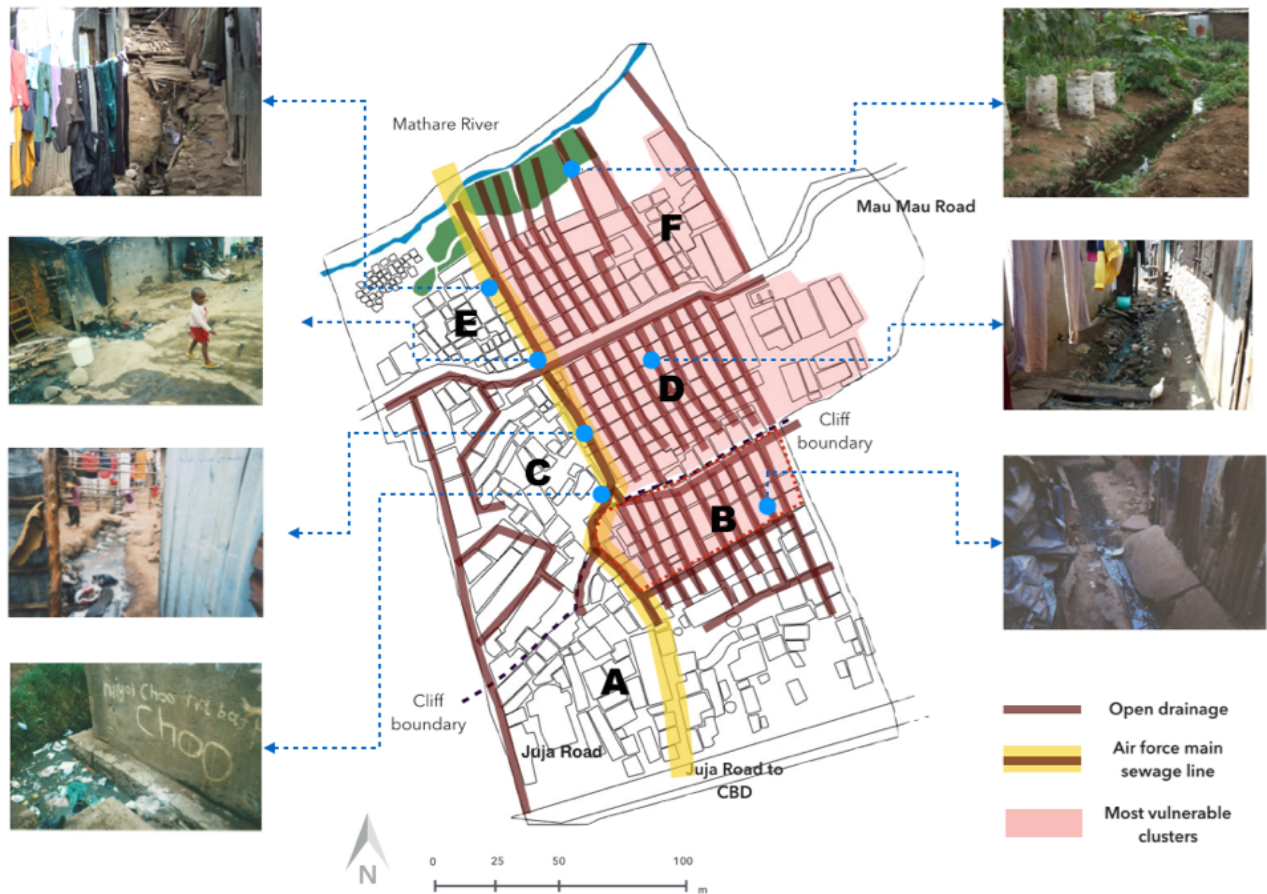


Fig. 4.5 Plan view of open drainage in Mashimoni, including main sewage line and most vulnerable clusters (constructed with information from Map Mathare and fieldwork, 2011)

Nonetheless, within this context, some of the residents manage to improve their built environment and reduce some of the health impacts by using different coping strategies. These include the use of timber to cover the trenches and building concrete ditches to effectively channel the sewage and avoid flooding. However, these strategies, specially the latter, do imply a substantial investment that many families cannot afford. Furthermore, the analysis of sewage as the most pressing scarcity in the built environment of Mashimoni, revealed a much more complex and multidimensional issue, that affects everyday life of residents beyond the exposure and pollution that is clear to the eye. The following section will outline the findings of how this scarcity is first experienced by residents in their everyday life, and later, how the findings of the transcalar analysis reveal the key barriers and lessons for the built environment.

(a) How residents live this scarcity everyday? Analysing the sites of scarcity, elements and relations

Condition A: Risk in everyday household and recreational activities

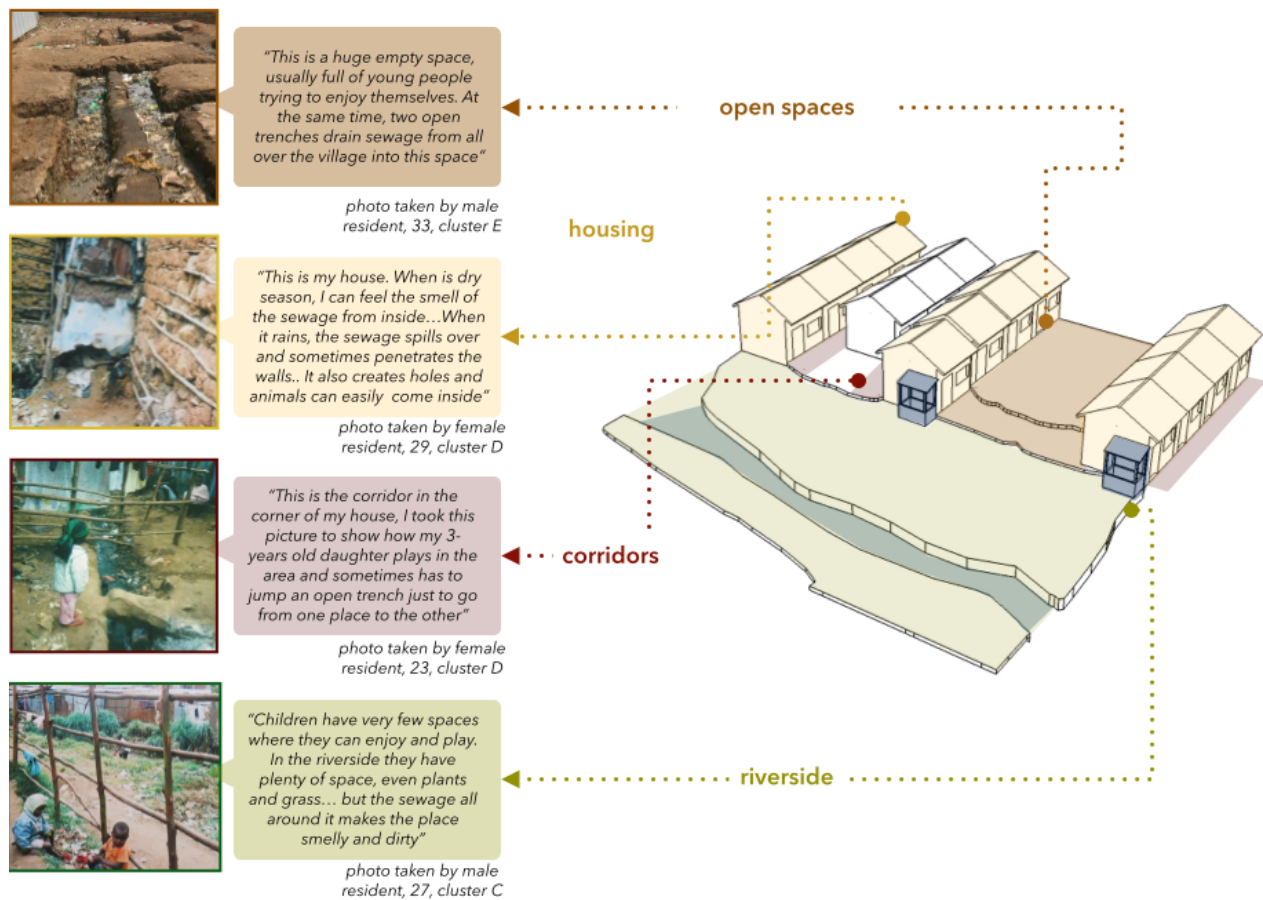


Fig. 4.6 Risk in everyday household and recreational activities - sites where this condition is experienced and personal narratives

Table 4.1 **Summary of condition A** | Risk in everyday household and recreational activities

Where? Sites of experienced scarcity	What and who? elements interacting everyday			How? relations between elements that create the conditions	
corridors	residents	exposed wires	recreation		material
housing	structure owners	house components	house chores		social
open spaces	children	pests	circulation		temporal
riverside	open trenches	platforms	open defecation		
		green areas			
		building materials			

The lack or poor condition of sewerage puts a direct constrain in how residents undertake everyday activities, whether they are household chores, like washing or cooking , or recreational activities, like socialising with neighbours, resting or playing. This condition constituted the most problematic firstly because it manifests itself in 4 out of the 5 sites in question, including the dwelling, open spaces, the riverside and the corridors, all of which are spaces of interaction and constant activity (See Fig. 4.6). According to the narratives, this condition is experienced in three aspects: Material, Social and Temporal.



The most straightforward and negative relation associated to risk is material, as residents are physically exposed to waste and sewage brought upon by open drainage into the spaces they use on a daily basis. Basic daily activities like cooking and washing clothes and dishes are usually undertaken in the corridor, and in some cases in open spaces. Corridors double up as open drainage, hence making simple activities as circulation and accessing the house, a threat. Even when platforms have been created to protect from the sewage, these platforms are built with cheap and non-resistant materials, hence corridors and access paths remain in precarious condition throughout. This material aspect is also exacerbated by the very limited financial capacity of families to invest in proper drainage or to improve the platform they utilise to protect from sewage. Considering the reliance on casual labour and the informal job market, residents have to prioritise food and health before investing in this issue.

Recreational activities are also affected daily, as these are commonly undertaken in corridors, open spaces and the riverside. Open spaces are commonly located in the trajectory of one or more open drainage, making the space a receptor of sewage, combined with garbage that frequently accumulates in vacant areas. Additionally all of these open spaces lack any kind of drainage, becoming easily flooded and attracting pests and odours into the space where residents, particularly children, usually socialise. In the dwelling site, the risk is associated to ventilation issues, as odours and pest attracted by the sewage permeate the dwelling space and affect both recreational and household activities while increasing the incidence of respiratory diseases.



social

The social aspect is associated to the effect that this scarcity has in social relations, particularly for women and children, as they have very limited choices for spaces of social interaction. Hence, even when these usually crowded spaces are free to enjoy and socialise, the poor condition and risks associated to sewage exposure deters residents of using them. Many small children and women are forced to remain inside the house or socialise only at church or in the school. Another social aspect of this scarcity is the bad perceptions associated to spaces riddled by sewage. This is particularly relevant to the riverside, which is a green open area that can easily be used for recreation. However, the effect of the open drainage in the access corridors towards the riverside, increases the bad perception of the area. Children are usually not allowed to go there by their parents and women feel unsafe.



Temporal

With regards to temporal aspects, disturbances to house chores are particularly more prominent in the evening, at the time when residents come back from work and begin cleaning or disposing of materials and waste. The open trenches often become clogged, increasing odours and in some cases causing flooding in the lower clusters of the village. In this condition, household activities or even resting in corridors cannot be undertaken.

Condition B: Difficulty in maintenance of circulation areas

This emergent condition was particularly relevant to corridors, as a highly utilised space for circulation, social and household activities (See Fig. 4.7).

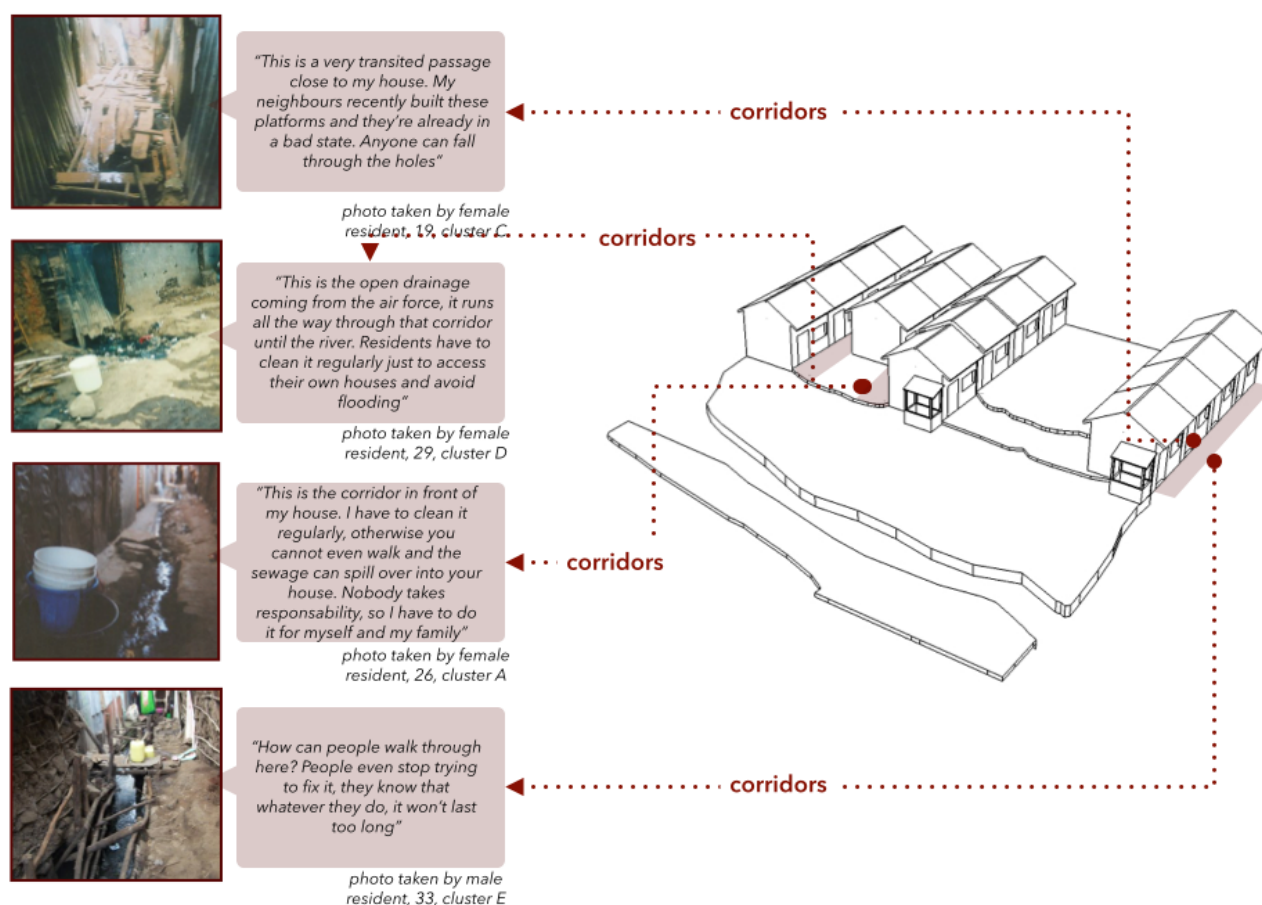


Fig. 4.7 Difficulty in maintenance of circulation areas - sites where this condition is experienced and personal narratives

Table 4.4 **Summary of condition D** | Difficulty in maintenance of corridors

Where? Sites of experienced scarcity	What and who? elements interacting everyday			How? relations between elements that create the conditions	
Corridors	residents	open drainage	circulation		material
	children	platforms			personal
		solid waste			
		exposed wires			



Material

Precarious timber platforms to cover open drainage in corridors, are usually made with cheap and scrap materials, making them less resistant to sewage and solid waste carried by open drainage. This means platforms remain in bad conditions throughout the year. Residents usually make the investment at the beginning, in order to both protect from the open drainage and extend their own working and social area from the house. Nonetheless, many of them expressed their difficulties in making major investments in either better materials or regular maintenance, as other expenses for daily survival and for emergencies become more important.



Personal attributes

Residents expressed antipathy and sense of powerlessness towards fixing corridors and platforms. This demotivation in investing, is brought partly by the fact that drainage is not maintained throughout the village and residents usually experience the consequences of contamination and mismanagement from other parts of the community. On the other, the demotivation also comes from the considerable amount of time and effort needed in maintaining corridors clean and walkable. Usually resident's time is already compromised by juggling several jobs at a time and household chores, including fetching water three or four times a day.

Condition C: discomfort and shame

This particular condition emerged from the analysis of scarcity in the dwelling site with regards to open drainage (See Fig. 4.8). Regardless of the poor condition of some of the houses, residents expressed the need to provide a 'smart' appearance to the inner space and to have the freedom to enjoy time inside their house, particularly to escape the sun, the dirt and the high temperatures outside. Moreover, the practice of receiving guests is common, especially for women during the day as a way to socialise or discuss issues, and for men during the night, when they come back from work. The fact that open sewage runs in front of every house in Mashimoni, deeply affects the sense of pride residents have of their own house. In the sections below, this issue will be explained in terms of the predominant relations between people, objects and activities in this particular condition.

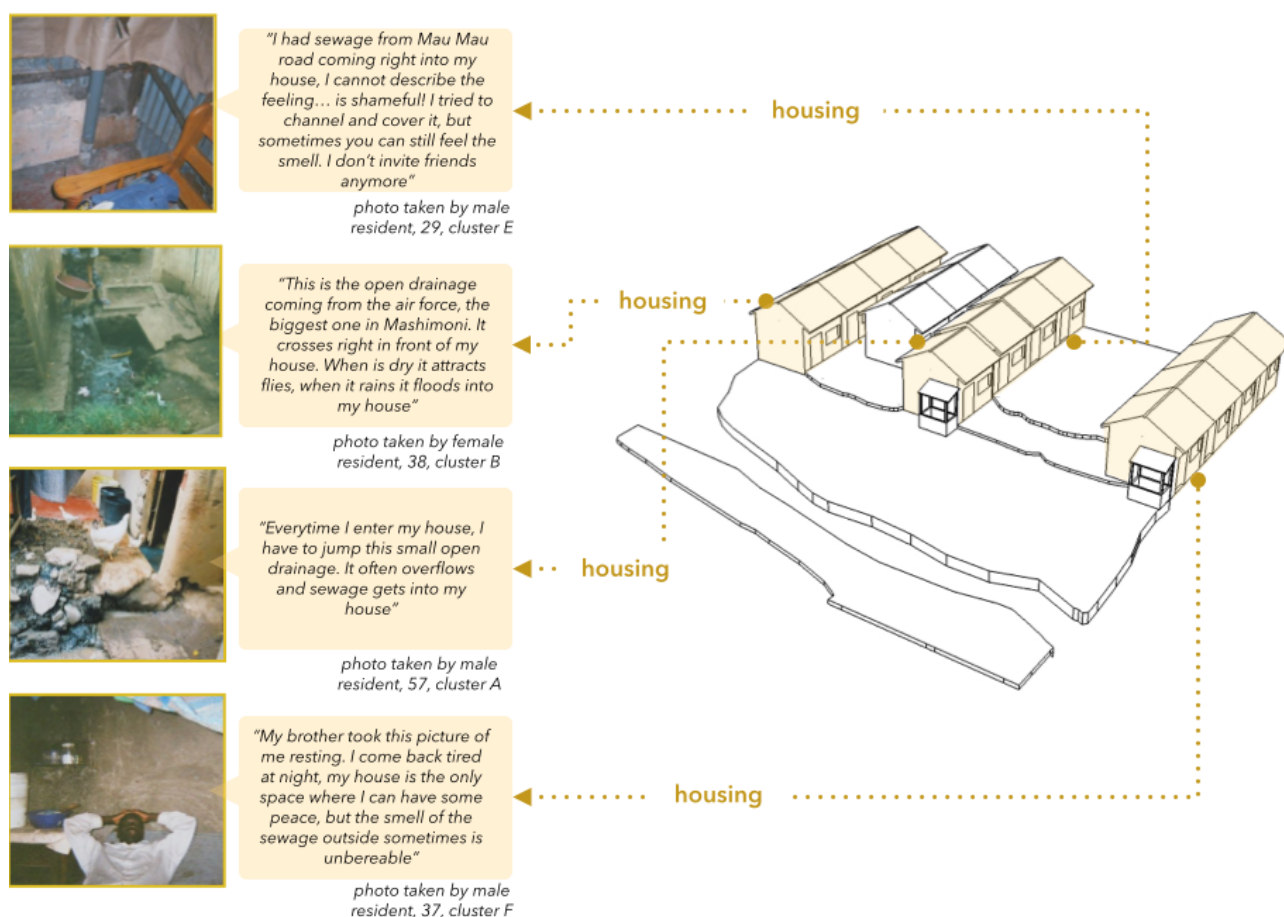


Fig. 4.8 Discomfort and shame - sites where this condition is experienced and personal narratives

Table 4.3 Summary of condition C | Discomfort and shame

Where? Sites of experienced scarcity	What and who? elements interacting everyday			How? relations between elements that create the conditions	
housing	residents	components of the house	recreation		material
	structure owner	building materials	house chores		social
		open drainage			personal
					temporal



Material

The material relation between the comfort and sense of pride against the disturbances caused by open drainage, goes beyond just the proximity to open trenches in corridors. It has been established already that the layout and density of the settlement makes it impossible to escape the effects of open drainage inside the house. Nonetheless, this material relation is also exacerbated by the permeability of the precarious materials and building methods used for the components of the dwelling (i.e. walls, floor, roof and windows). Overflowing sewage easily permeates through holes in the rammed earth or iron sheet walls, which in turn increases the chances of odours and pests coming into the house. Ventilation issues related to open drainage are also caused by the internal spatial disposition. Cross ventilation is non-existent in the majority of the cases. Finally, once again, the lack of a stable income and fluctuating (non regulated) rents makes it almost impossible to invest in major transformation of the internal space to address this particular condition.



Social

The social aspect of this emergent condition is related to the inability of residents to use their house for social activities involving neighbours and friends. Although this aspect was commonly mentioned behind the financial constraints and the physical quality of the house, the explanation of the effects of this particular scarcity was heavily emotional and underscored when discussing everyday life. They expressed it affects how they are seen within the neighbourhood.



Personal

The personal aspect is related to the inability to enjoy and feel proud of their house as users. Many of the residents also lack of skills and motivation to invest in the house. Demotivation comes from the lack of ownership and instability of the tenancy situation. There is reluctance to invest knowing that the house is not really theirs and they can be evicted at any moment.



Temporal

The evening time proved to be the most problematic regarding this condition as the time to rest, meet and receive guests coincides with the frequent clogging of sewage during peak hours. The flow of sewage in the open drainage increases in the evening when people return from work due to grey water from house chores like washing dishes and clothing. Furthermore, it is also an usual

practice to shower during the evenings, often in small cubicles within the corridors, hence disposing of water in the open drainages nearby.

Condition D: Low productivity and discouragement of collective activities

The fourth emergent condition is related to the effect of sewerage in economic and collective activities. This condition is manifested in 4 out of the 5 sites of scarcity: business kiosks, open spaces, corridors and the riverside (See Fig. 4.9). The three sites of scarcity in question, are constantly used for economic activities, including selling goods, urban agriculture and manufacturing of products. And at the same time, these spaces are in direct contact with open drainage across the settlement. In the same line as the previous discussion, this condition is composed by relations that are material, contextual, social, and personal.

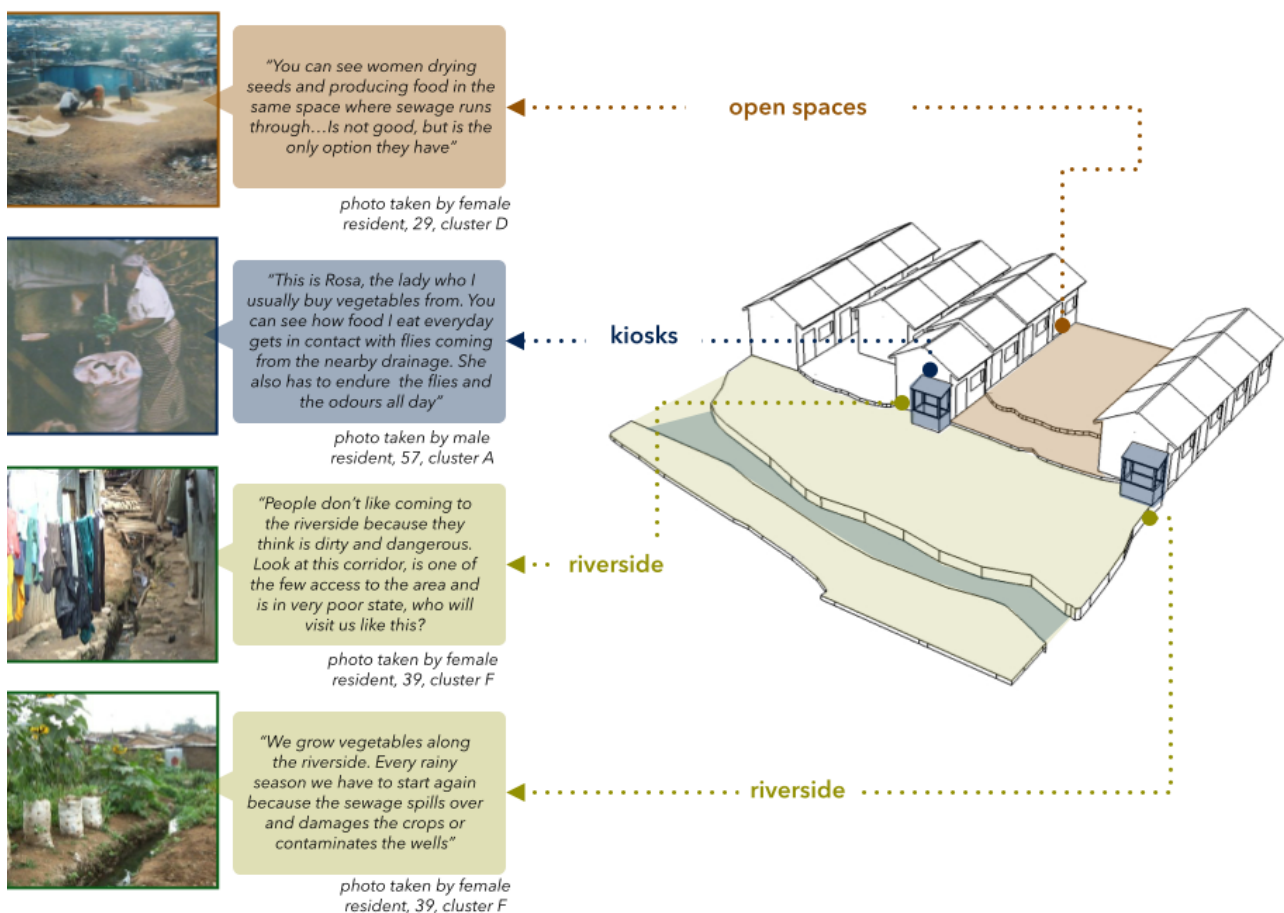










Fig. 4.9 Low productivity and discouragement of collective activities - sites where this condition is experienced and personal narratives

Table 4.2 **Summary of condition D** | Low productivity and discouragement of collective activities

<i>Where?</i> <i>Sites of experienced scarcity</i>	<i>What and who?</i> <i>elements interacting everyday</i>			<i>How?</i> <i>relations between elements that create the conditions</i>	
					
open spaces	residents	produce	selling/ manufacturing		material
riverside	sellers/farmers	solid waste	circulation		contextual
kiosks	customers	open drainage			political
corridors		water wells			social
		allotments			temporal



Material

The material relations within this conditions involve the direct contact of sewage with people (sellers and customers) and with produce. On the one hand, residents expressed their concern on how sewage contaminated the very food they consume. They observe kiosks and produce located right next to open drainage, hence in proximity to human waste and garbage.

Furthermore, allotments and the merchandise sold in the market in the riverside is frequently damaged by sewage. Allotments are often lost to flooding caused by both the river and open drainage crossing the riverside. More importantly, water wells used to irrigate the allotments become contaminated by overflowing trenches. This situation results in produce being lost or contaminated and discouraging the residents from participating and investing in these practices. It also discourages residents to buy food produced within the village.



contextual

The contextual relation refers to the specific contamination of the riverside and, particularly of its access corridors. The riverside is one of the few open spaces used for productive and collective activities on a long term basis, with a established market and several collective allotments. However, the fact that the only way to access it is through corridors that double-up as open drainage, means a lot of its potential is diminished when residents and clients are detracted from visiting. The constant state of disrepair, the lack of a proper access path and the constant overflowing of sewage, poses

great risks to people using the area. More, over, the layout of the settlement and the sewerage system, makes the riverside the recipient of all the sewage from the village and from beyond the air force grounds. This makes the riverside constantly riddled by sewage, affecting the produce, vendors and the small-scale economy of the village.



Social

Residents expressed the riverside not only has a physical constrain that detracts people from visiting. There are also bad perceptions among residents and visitors attached to the area, including lack of safety, source of diseases and injuries. Residents associated this bad reputation partly to the current situation of the sewerage, all of which evacuates in the riverside.



Personal

Demotivation to invest in business when produce gets spoiled or customers decrease. This is particular relevant for small-scale vendors, usually located in the most vulnerable areas and without proper physical structures to protect themselves and their produce. Loss of clients and damaged produce has a high impact in their investment and deters some from investing on a long term basis.

(b) Lack of adequate sewerage: effects across sites of experienced scarcity

After analysing each site and the conditions emerging in relation to this experienced scarcity, the second step involved an examination of the sites as one assemblage. How do these sites interact with each other? Which ones are more affected and which ones are exerting more negative effects in others? The effects are measured according to the emerging conditions previously explained, which become more relevant according to the number of sites they affect and the multidimensional aspect of the relations. In this way, priorities in terms of sites and interventions can start to be established.

The diagram in Fig. 4.10 shows how sites interact with each other. Corridors, marked in red, are identified as the most problematic site in relation to its lack of maintenance and the repercussion it has in the rest of sites that it connects to. When the condition of corridors, doubling-up as open drainage, worsens, it has a domino effect on all the sites that it crosses through, including the house, the open spaces, the kiosks and the riverside. This shows that as long as corridors double as open drainage, its adequate use and maintenance is critical for the rest of the spaces in the neighbourhood.

Fig. 4.10 Lack of adequate sewerage | Effects across sites of **experienced** scarcity

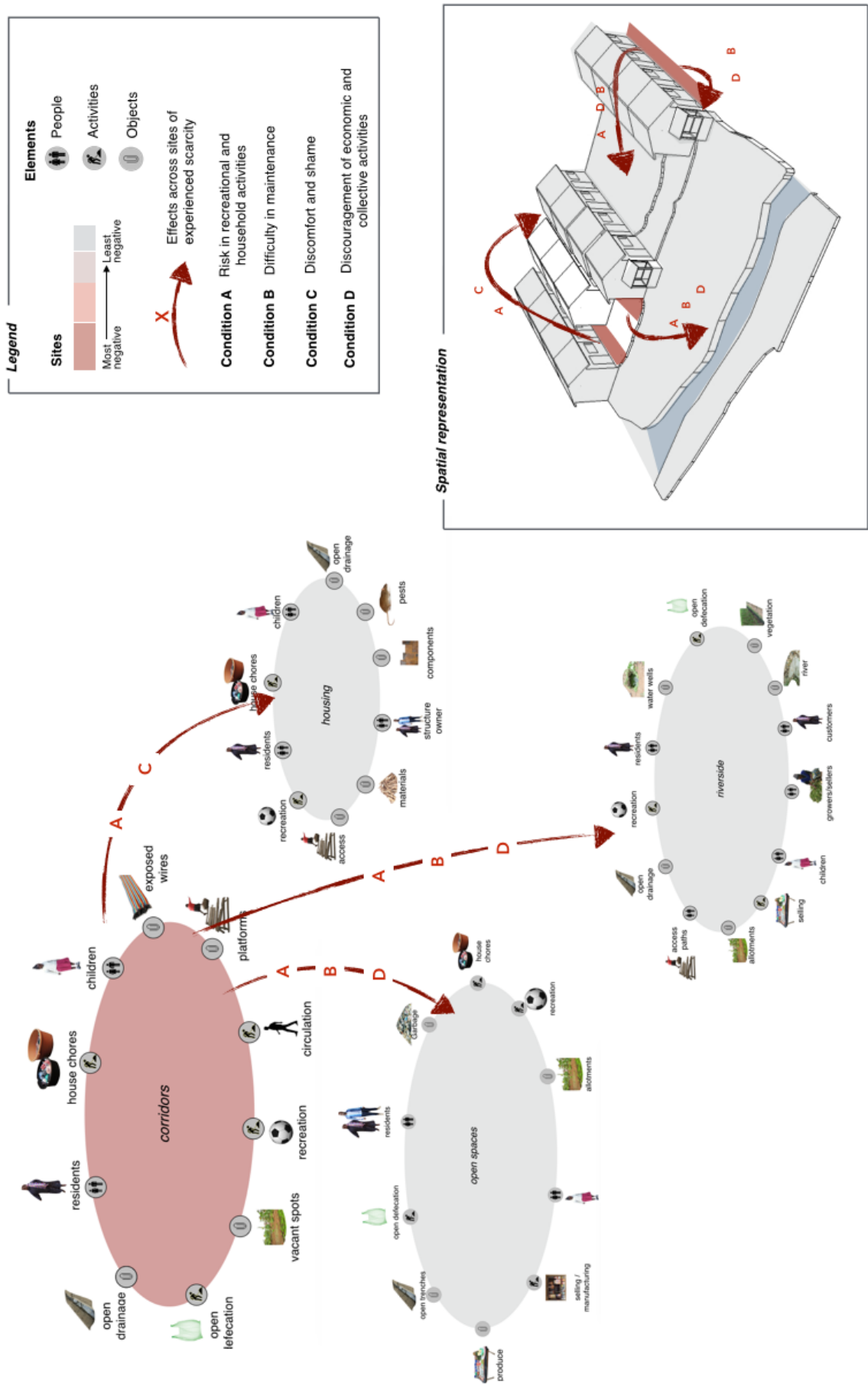


Fig. 4.11 **Lack of adequate sewerage | Constructed scarcity Layer 1:** Analysis of issues in the translocal and transcalar diagram according to their material, contextual, political, social, personal and temporal nature

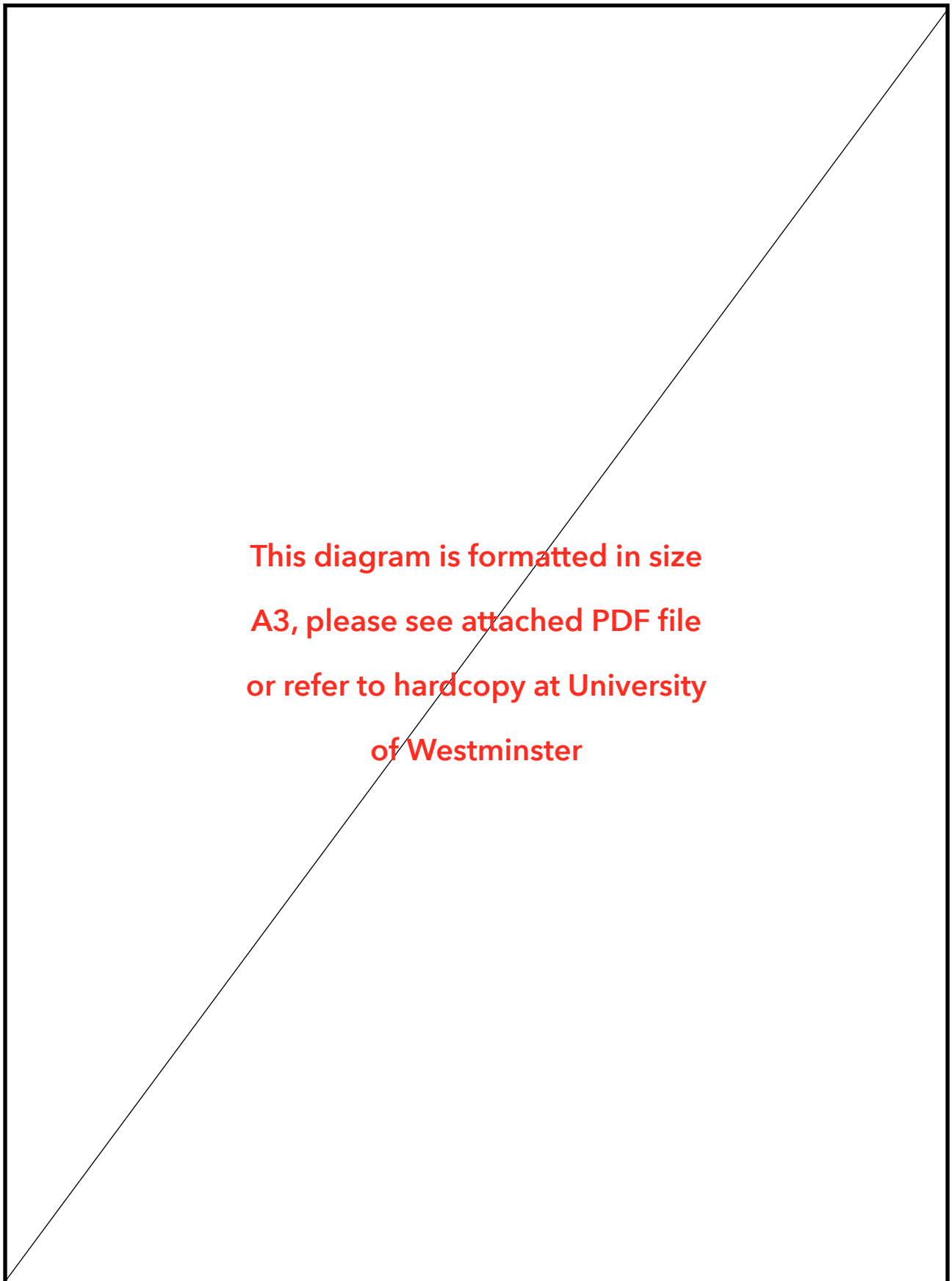
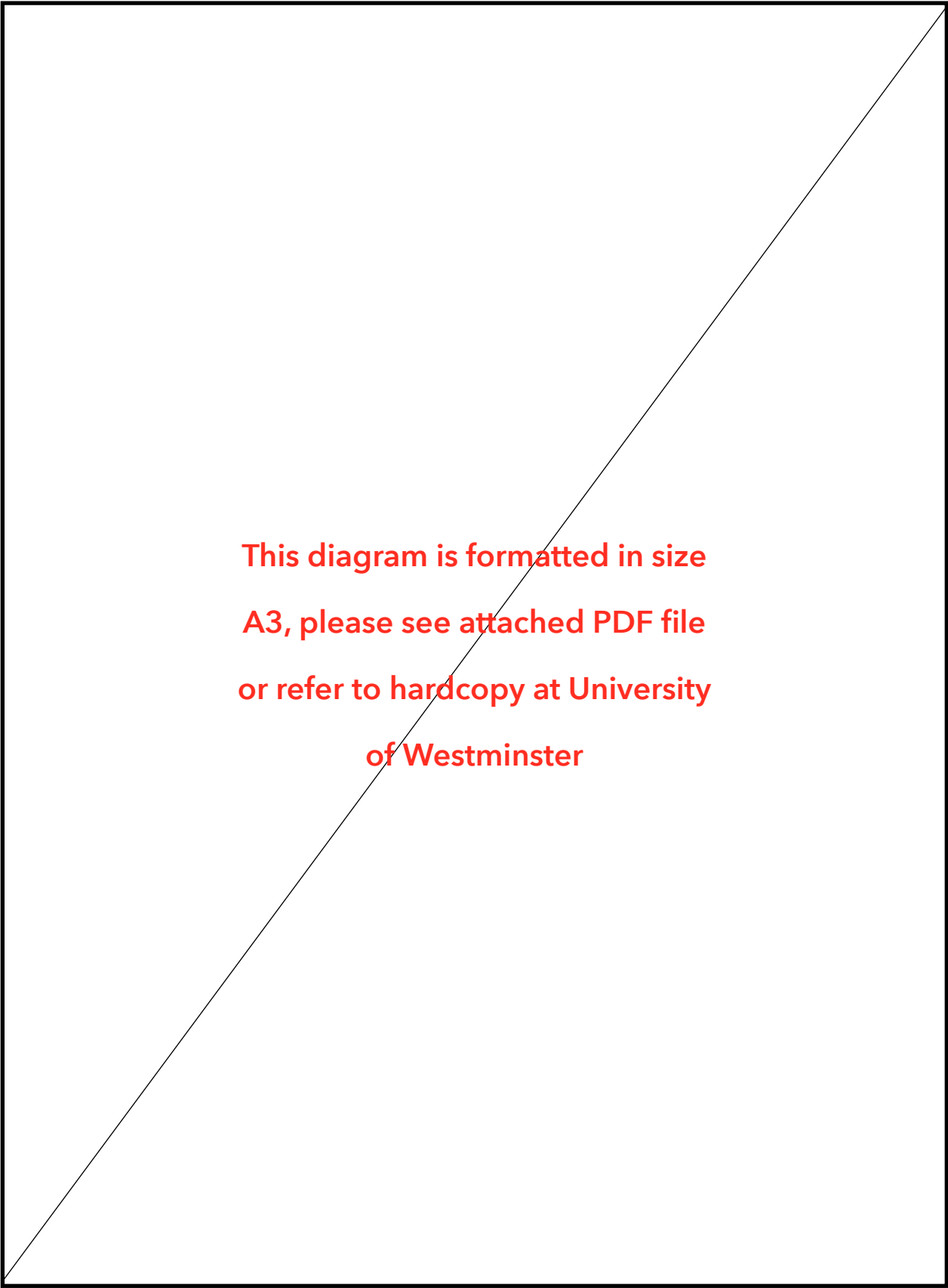


Fig. 4.12 **Lack of adequate sewerage | Constructed scarcity Layer 2:** Analysis of key actors, sites and activities in the translocal and transcalar diagram



(c) From experienced to constructed scarcity: transcalar and translocal diagram

The translocal and transcalar diagram of the lack of adequate sewerage was constructed with information from the fieldwork, further interviews, mapping, observation and analysis of secondary data (See Fig. 4.11 and Fig. 4.12). Findings are organised according to the categories emerging from the discursive, distributive and socio-material aspects of scarcity: Material, Contextual, Political, Social, Personal and Temporal. In the case of this scarcity, the key relations that emerged in order of incidence, were **Material, Contextual, Personal, Temporal, Social** and **Political**.



Material

The material relations are more straightforward, and refer to the conditions of the trenches, the platforms on top of them and the corridors. It also includes the poor building materials and techniques, the sewage and waste from Juja road drained inside and across the village, how residents use the platforms as extension of their home space and the limited interventions from CBOs and NGOs in sewerage system. With regards to productive activities, the material aspects also refer to the kiosks built with poor materials and techniques and how the investment is made mostly on produce, not on the structure or surroundings.



contextual

Contextual qualities of this condition is associated to the layout of how the drainage was planned and the density of the settlement. Every corridor doubles-up as open drainage, some planned by previous settlers, building companies and structure owners, and others emerging spontaneously throughout the years. There was little or no planning in their layout. The fact that corridors, which connect to social and private spaces in the neighbourhood, are riddled by sewage, makes residents constantly exposed. Another contextual aspect is the fact that some clusters are more affected than others, and many times suffer the consequences of mismanagement from other clusters. This is particularly common in clusters D, F and B, located under the cliff and closer to the riverside. The riverside, as a social space, is particularly affected by its position, acting as the final repository of sewage and exacerbated by the garbage and materials brought from the higher sector of the settlement and even from the air force across Juja Road.

The location of corridors within the village plays a key role in the quality, use and maintenance of corridors. Clusters D, E and F, are usually more affected by sewage, debris and waste carried by open

drainage from the clusters above the cliff, Juja road and as far as the Air Force ground across the road. The only exception are dead-end corridors, usually located close to the cliff walls, which remain more private and less transited. Residents in this case seem to invest in more resistant materials for drainage like cement. The heavy slope encountered in some areas increases the flow of sewage and the risk of clogging and overflowing. The main sewage coming from the Air Force grounds, across Juja Road and down the cliff, was identified as the most damaging trench, carrying substantial amount of debris, sewage and waste and affecting the corridor and every household along it.

Additionally, access paths to the river double up as open drainage, only partially covered by deteriorated and very precarious timber platforms. This means the access to the riverside, as one of the areas with more economic activity and collective efforts, is constantly damaged by sewage and remains in precarious conditions deterring customers and residents from visiting or using the area.



Personal

Residents expressed no motivation in intervening in open spaces, corridors and the riverside for recreation purposes. Most of the interventions mentioned were related to the building of platforms over corridors, in response to the undertaking of house chores and circulation. When it comes to recreation, residents felt powerless or demotivated, particularly for the lack of knowledge or skills, and the fact that they feel that whatever they do, others will destroy. Additionally, residents articulated that they felt a sense of shame by the inability to receive guests in their homes, without being exposed to odours or spilled sewage in fronts of their houses.



Temporal

Temporal relations within this condition is related to the seasonal weather changes that exacerbate the effect of sewage in business kiosks and manufacturing activities. During the rainy season, overflowing of sewage is frequent, causing flooding that contaminates crops and water wells and damages merchandise, especially in open spaces and the riverside. On the other hand, dry season brings strong odours from the trenches that in turn attract flies, discourage customers and causes general discomfort to vendors that work all day long next to open drainage.



The social relations analysis identified, that small enterprises and kiosks, are perceived as **highly individual** and **short term initiatives**. The focus remains on establishing short term businesses to produce income for daily expenses, without a focus on maintenance of the kiosks or the space, collective organisation with other vendors or a strategic long term plans. In this case, the frequent damage and discomfort caused by open drainage in these key sites, make it even more difficult to encourage collective entrepreneurial activities within the residents.

There is no social organisation or collective approach to the maintenance of corridors, with very few exceptions. These exceptions, as mentioned above, are more related to geographical location, determined by the privacy and level of transit in the corridor. In this case, neighbours have contributed financially and with labour to improve the trenches. However, in the majority of cases, improvement is done by individuals or families.

Women once again are particularly a vulnerable group, as they lack the skills to intervene, although they are the main users of the platforms. They expressed they have to rely on handy men within the neighbourhood or build/fix them themselves but with less desirable results.

Through the fieldwork it was clear that only the larger scale businesses located in Juja Road are organised, while small scale vendors, usually located in small corridors or along Mau Mau road, have no organisation or political representation that address this type of issues.



The political relation of this condition is associated with two aspects: firstly to the lack of influence that residents have on how infrastructure is provided, planned or maintained. Residents expressed there are no mechanisms for them to complain or demand improvement of sewage, or even demand better household and commercial practices (i.e. not throwing garbage on the trenches or flying toilets). Secondly, there is an actual physical constraint that forces residents to use sewage-riddled spaces to socialise or perform house chores. Residents have no choice and cannot escape the risks associated to sewage exposure.

Residents that are tenants, have no influence on how houses and internal spaces can be done and modified. There is no decision-making mechanism in place for residents to complain or demand improvements or modifications. Moreover, without ownership or tenancy rights, residents find themselves in a precarious condition where they can be evicted without notice. This situation disempowers residents in their capacity to both invest in their own dwelling (without being certain they can remain there indefinitely) and in their capacity to negotiate improvements with owners, as they are aware of the high demand for rental structures in the neighbourhood and can easily find new tenants if the current ones complain or make demands. In terms of the improvement of the sewage infrastructure in front their house, residents have no influence on how the sewage is built, maintained, used and managed. Individual small interventions are allowed and require no permission. Nonetheless, bigger interventions at the corridors or cluster scale required the approval of the assistant chief.

Residents use and appropriation of spaces for economic and entrepreneurial activities are extremely limited in Mashimoni. When opportunities arise, and space becomes available, these areas are constantly affected by sewage through open drainage and flooding. The political aspect of this condition refers to the inability of the residents to control or avoid damage to their produce and health risks to themselves. Residents expressed a sense of powerlessness, as even though some of them pay high fees (approximately 1,000KSh) to register their business and additional fees to use the space, this doesn't concede rights to submit complains or suggestions on the adequate maintenance and management of the areas.

Residents have no say in how sewage infrastructure is used and managed across the neighbourhood, which affects anything on its proximity, including corridors and platforms built for protection and circulation. There is some confusion in terms of ownership and responsibility over corridors and structures built on it.

(d) Initial lessons for the built environment and key sites, elements and actors

Key actors: Residents, pedestrians, clients, CBOs and NGOs

Key sites: Corridors, housing, riverside, Juja Road

Key elements: Drainage, topography, layout, main sewage line, waste, materials and platforms

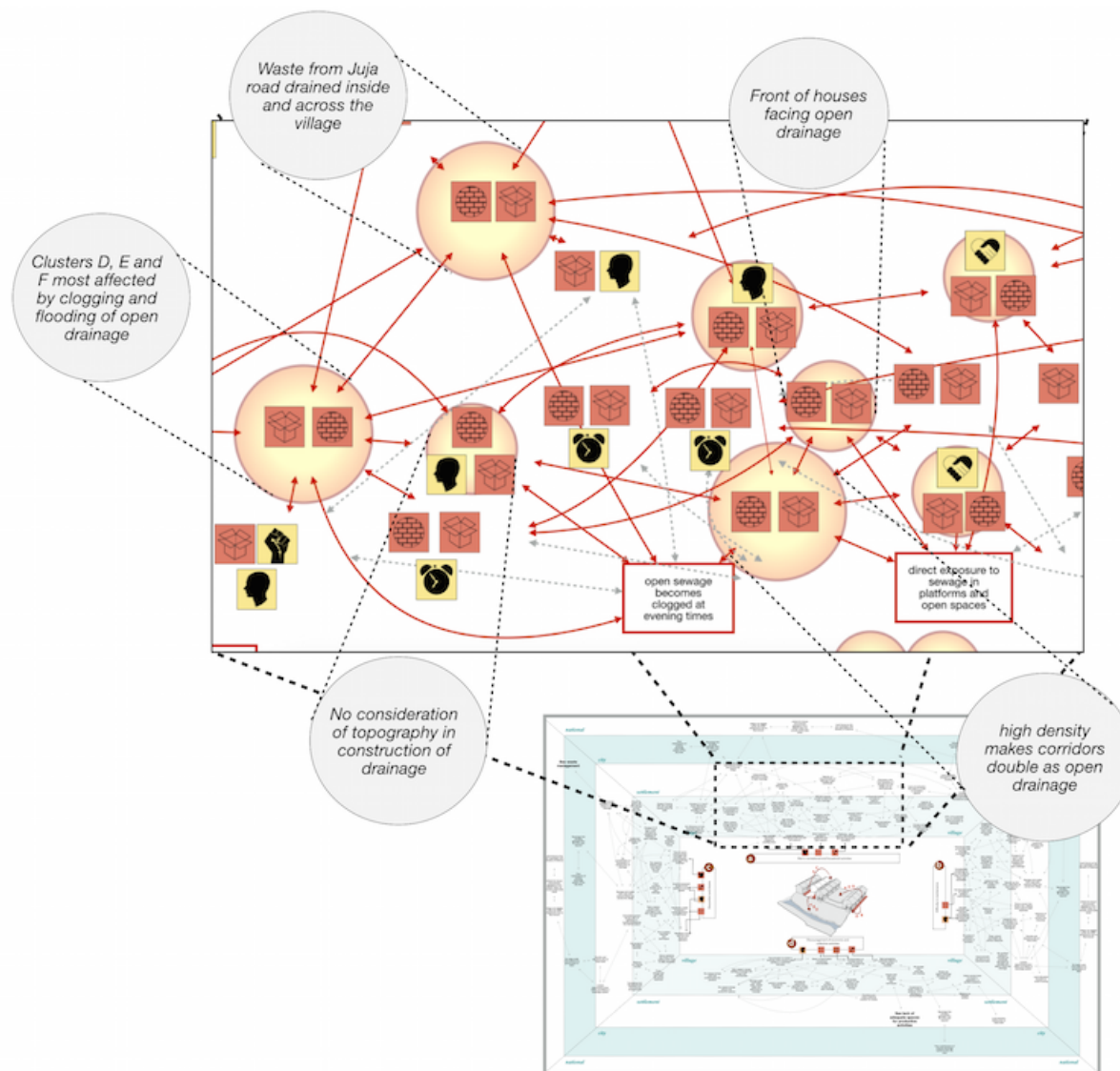
Key activities: Flooding, clogging

The material and contextual aspects were the key ones emerging from the transcalar analysis (See example of some of these key findings in Fig. 4.13). And while the material aspects require financial investment in better materials and construction techniques, the contextual aspect demanded a more strategic thinking and an essential negotiation and collaboration with other villages and the Air Force grounds, as well as the users of Juja Road. The contextual aspect also identified the need for a better strategy horizontally, in terms of the village itself. It identified key areas that are priority to address, including specific clusters that are more affected, and areas that exert the most negative effects, like Juja Road and the main sewage line. This contextual aspect gives lessons from the built environment, in the sense that it requires collaboration within the village and with its surroundings, as well as the need for technical innovation that takes into account topography and the current density of the village. The fact that all key aspects in the transcalar diagram were both material and contextual (instead of only material) clearly offers the lessons that without taking into account these contextual aspects, any investment in material interventions like better platforms, or even punctual interventions by other actors, will not have a beneficial effect for the village or for each of the conditions this scarcity creates across the village.

Another important finding is the lack of recognition of the sewerage problem as relational to other clusters, the contextual qualities of the village and the surroundings that exert the biggest effect in the area (the fact that Juja Road and the Air Force grounds affect the village internal corridors on a daily basis). There is also a complete disregard for contextual aspects, like the topography and the geographical features like the cliff, and how these affect some clusters more than others. Furthermore, most of the tactics employed by residents are highly individual and short-term basis, and consists of regular cleaning and unclogging or of hiring other people to do it.

It also emerged that this condition affects the economic prospects of residents within the village, a key aspect considering most residents rely on casual labour and the implementation of several safety nets like kiosks, allotments and small scale businesses.

Fig. 4.13 Lack of adequate sewerage | Example of key contextual and material findings extracted from main diagram



4.3.2 LACK OF ADEQUATE AND FLEXIBLE HOUSING

Slum upgrading is therefore not a matter of building decent houses, it is also about taking into account intricacies of life in urban slums while striking a balance between affordable housing and innate need for survival (Ettyang, 2011:148)



Fig. 4.14 An overview of the housing conditions across Mashimoni

There are a range of different types of housing types and households in Mashimoni, depending mainly on the household income and on the cluster the 'structure' (physical house) belongs to. The average rent for a one-room structure generally ranges from 800 Ksh to 2000 Ksh depending on the location. The settlement is divided into clusters, named after the alphabet. Clusters closer to Juja road are normally more expensive, but the higher-quality of their construction raises up the renting price, even though the quality is still low (tin and iron shack).

There are also some much wealthier areas, to which the access is regulated through a gate that is kept locked a night. These areas revolve around a courtyard that is larger than the average alley (private dead-end corridor). Some of the wealthy people who live in these clusters, who typically own a business, don't move out of Mashimoni to areas of higher quality as they are afraid of losing their customers.

There is a main housing typology in Mashimoni. It is a one room shack which often has a 'wattle and daub' structure: a network of wood sticks covered in mud clay. Another solution is to use corrugated iron both for the walls and for the roof. Roofs are often built from asbestos concrete tiles. In this case, on the internal side of the roof, blankets are hung in order to protect the area underneath from

falling pieces, rust particles, or even rain water. In the metallic roof a hole is often cut and covered with plastic to allow the sunlight get in. Even though some households do have windows, they are kept closed and sometimes blocked for security and privacy reasons. Exceptionally, in the case of shops, the opening serves a display of goods and thus remains open. Interior spaces are usually free of internal walls, but are usually divided by a sheet to differentiate the living area from the sleeping area. The cooking facilities are located most of the times close to the door.

Most of the shacks are provided with electricity though usually through illegal means. Approximately only 3% of the households in Mashimoni has formal electricity connection, which is the lowest percentage in Mathare Valley (MUST et al., 2012). The rest of the households often utilise unofficial taped connections and pay a fixed fee between 300-400 Ksh per month. Direct water supply is not available to most of the households. Weather and seasonal conditions determines the price of it, and it varies between 2 and 25 Ksh for 20 litres, but sometimes can reach 50 Ksh. Water can be bought at both legal and illegal taps that can be found all around Mashimoni. It must be noted that by the time of the fieldwork in 2011, there ongoing works by the Nairobi Water Company to provide a new water pipe network to the settlement.

After this general introduction to the overall housing situation in Mashimoni, the next section will outline the findings of deconstructing this scarcity, poor condition of housing, at the micro level. As in the previous scarcity, it does so by explaining according to the emergent conditions identified through the analysis of fieldwork data, and explaining the many elements and relations between them that come into play to create and reinforce the specific condition.

(a) How residents live this scarcity everyday? Analysing the elements, sites and relations

Through the analysis of the fieldwork, three sites of scarcity were identified in relation to the poor condition of housing in Mashimoni: **the structure itself, the corridors and the neighbourhood** (See Fig. 4.15). Each of the sites manifest conditions experienced by the residents. These conditions will be deconstructed in order of relevance below, to understand the elements at play (people, objects and activities) and the relations that create the condition and reinforce it: a) Risk associated to ventilation, pollution, fire, collapse and flooding b) Rigidity of space and, c) Constant threat to tenants and their neighbours (disruption of networks and social ties).

Condition A: Risk associated to ventilation, pollution, fire, collapse and flooding

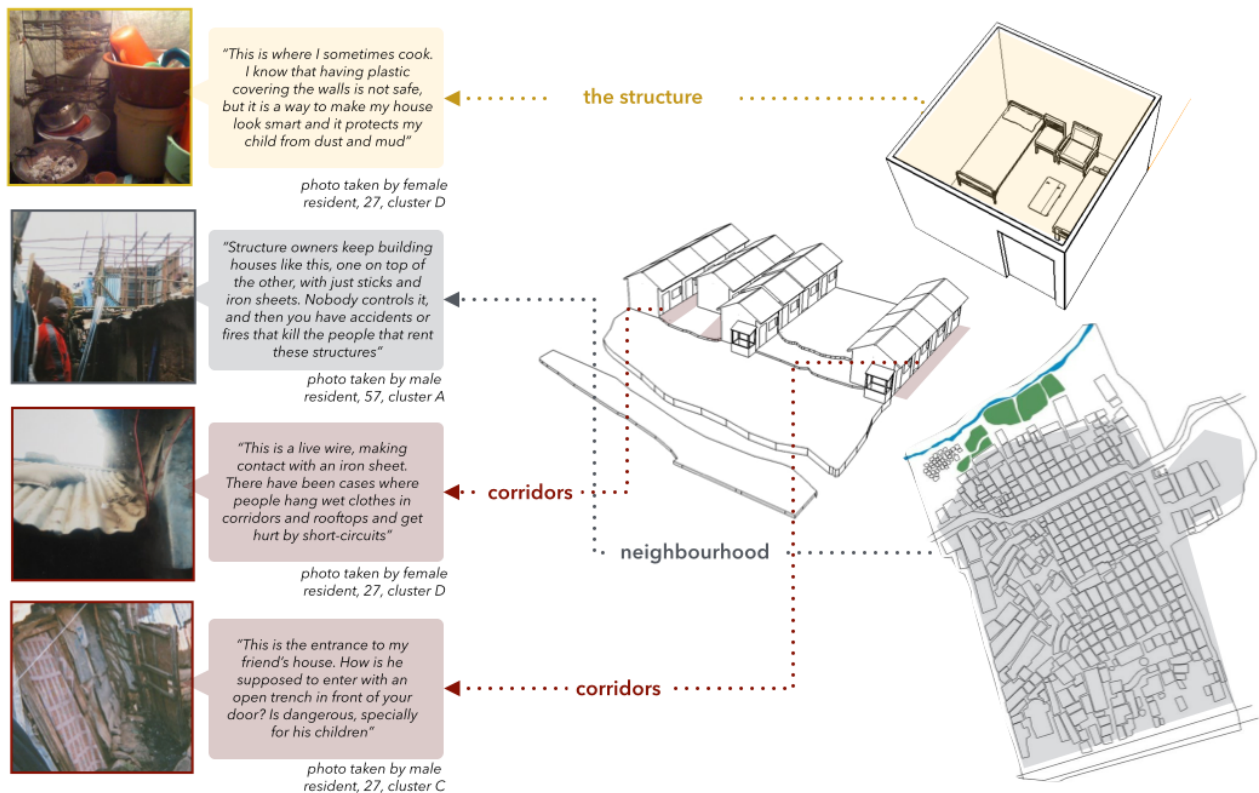


Fig. 4.15 Risk associated to ventilation, pollution, fire, collapse and flooding - sites where this condition is experienced and personal narratives

Table 4.5 **Summary of condition A** | Risk associated to ventilation, pollution, fire, collapse and flooding

Where? Sites of experienced scarcity	What and who? elements interacting everyday			How? relations between elements that create the conditions	
housing structure	residents	components of the structure	recreation		material
corridors	structure owners	building materials	house chores		political
neighbourhood		open drainage			social
		platforms			personal
		pests			temporal
		exposed wires			



Material

Risk associated to the dwelling structure is related to problems with ventilation and risk of fire. This risk is associated to internal disposition of the space and to the components of the house (i.e. walls, rooftop, doors, floor) that are usually built with extremely poor quality materials including corrugated old iron sheets, asbestos, wood sticks and mud.

Risk of fire is exacerbated by the flammable materials that residents used to cover the mud in the walls. Residents utilise goony bags, fabric, newspapers and carton to create a more polished surface, whether for decoration purposes or to protect the wall from crumbling. They do this as well to minimise the damage to their clothes and furniture and to avoid children ingesting mud from the crumbling walls. At the same time, with 97% percent of the households not having access to formal provision of electricity, a large number of families have to rely on open flames devices to cook or illuminate the space at night. This is the case with coal-fuelled “Gikos”, paraffin stoves and kerosene lamps, that are frequently used among families in Mashimoni. These combination of open flames and flammable materials that spread fire rapidly poses a great risk for families in Mashimoni. The risk in the corridors is related to informal provision of electricity and open sewage. Illegal electricity is often composed by a complicated and chaotic network of cables, thrown over iron rooftops and sometimes reaching the corridors and remaining exposed to residents and pedestrians. Water and more often sewage, can easily come in contact with exposed wires and create short circuit. This risk is further exacerbated when expanded to the neighbourhood site. Extreme density and narrow corridors means that fire is rapidly spread and access to firemen or any other assistance is physically impossible.

Residents also expressed the risks associated to precarious and unregulated building of structures in the neighbourhood. Houses are built in short periods of time, sometimes in vacant areas not suitable for habitation. Some of these construction is carried out at medium scale, involving 3 or 5 houses at a time and in some cases involving multi story building using timber and corrugated iron sheets. In the case of fires, some structure owners have rebuilt the houses using the left over materials from the fire. Issues with ventilation were frequently mentioned by residents. Cooking activities and odours from the sewage usually pollute the air inside the house, cross ventilation is almost inexistent as windows are too small or inexistent.



Political

Residents, in their capacity as tenants, with no claim to the land and no legal document protecting their status, often find themselves powerless, unable to influence how houses are built and maintained. Structure owners find themselves on the other hand, in a advantaged position, as competition for structures in Mashimoni remains high, and they feel no need or pressure to invest in better quality of housing.



Social

The social relations emerged when discussing ventilation issues. High density of Mashimoni means fronts of houses are separated from each other by only a very narrow corridors, which in turn is sully overcrowded by neighbours and passers-by. This means openings, whether they are doors or windows, sometimes need to be kept closed, to avoid intruders and preserve privacy. Many of the women expressed concern on staying alone for the day, especially when they don't have social connections in the neighbourhood, and prefer to keep doors closed.



Personal

Children and women more affected, lack of skills to adapt housing and make it more resilient. Certain practices, involving open flame devices or fumes, are common in Mashimoni. There is lack of knowledge on dangerous materials and practices.



Temporal

Certain risks increase at certain times of the day and seasons of the year. Large scale flooding is a problem during the wet season, but smaller scale flooding caused by clogged and overflowing sewage can occasionally affect any time of the year. Ventilation issues are more manifested during the dry season. High temperatures combined with iron sheets often produce detrimental micro climates inside the houses.

Condition B: Rigidity of space

The second most relevant condition emerging from poor quality of housing, is rigidity of space (See Fig. 4.16). This rigidity is related to the lack of ownership and therefore the legal and physical constraints into what alterations and improvements can be done to the house.

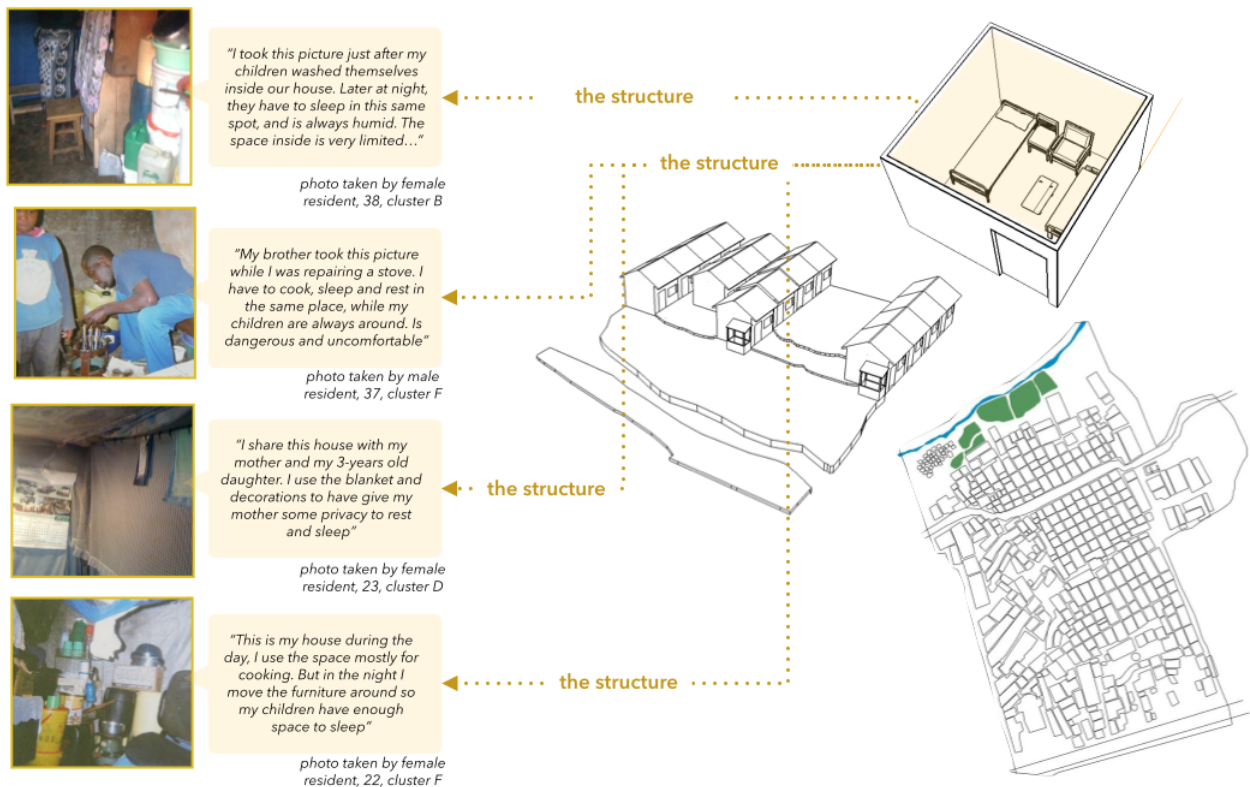


Fig. 4.16 Rigidity of space - sites where this condition is experienced and personal narratives

Table 4.6 Summary of condition B | Rigidity of space

Where? Sites of experienced scarcity	What and who? elements interacting everyday			How? relations between elements that create the conditions	
housing structure	residents	components of the structure	recreation		material
	structure owners	building materials	house chores		political
		platforms			



Material

There is, undeniably, a strong material constraint to what residents can do with the house they rent. The actual internal space available is extremely limited, hence, internal partitions or transformations are rarely feasible. Residents rely on blankets and pieces of furniture to organise and delimit inner space, which also is rearranged several times throughout the day to accommodate different household activities, including sleeping, cooking and receiving guests.

The limited space, coupled with large families, also means that overcrowding conditions are common. Potentially hazardous activities like cooking or using open flame devices for lighting, are undertaken close to family members, with a particular danger posed to children.

Furthermore, the majority of households rely on unstable income, making it difficult to undertake substantial investments in the structure. On the other hand, structure owners have the resources to invest, but don't have the need, as competition for houses is high in the Mathare area and potential occupiers are usually guaranteed, despite poor condition of the houses.



Political

The relation between structure owners and residents is highly unequal, in detriment to quality of life of the tenants. Residents have very few choices and no voice in the quality of housing offered to them. Even if there was space for modifications, residents are unable to claim basic improvements or small investments to structure owners. A constant threat of eviction means that alterations and improvements may not be a sensible investment, as there is no guarantee that they will be able to remain in the house on a long term.



Social

The social relation identified is related to the effects that a rigid internal space has on family relations and the relation of the household with their neighbours. Overcrowding conditions affects the recreational opportunities family members have inside their own house, particularly when weather or outside conditions are harsh (i.e. heat waves, dust and winds, strong rains, unpleasant odours). Moreover, women and small children have limited choices for safe recreation, and sometimes the house becomes the only opportunity for resting and socialising.

Condition C: Constant threat to tenants and their neighbours (disruption of networks and social ties)

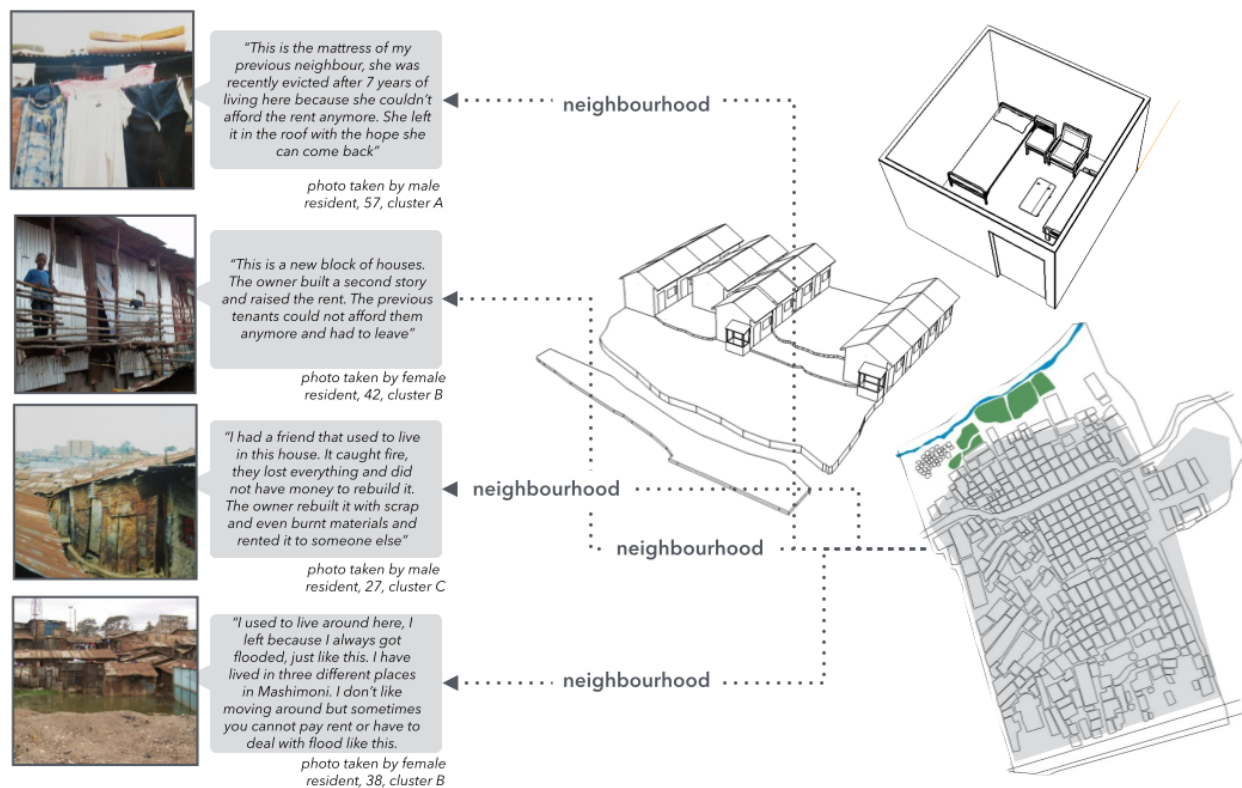


Fig. 4.17 Constant threat to tenants and their neighbours (disruption of networks and social ties) - sites where this condition is experienced and personal narratives

Table 4.7 **Summary of condition C** | Constant threat (disruption of networks and social ties)

Where? <i>Sites of experienced scarcity</i>	What and who? <i>elements interacting everyday</i>			How? <i>relations between elements that create the conditions</i>	
neighbourhood	residents		eviction		material
housing structure	structure owners		fires		political
			flooding		social
			Unregulated building of structures		

One of the conditions that emerged from everyday narratives, particularly through the photo-voice exercises, was associated to the disruption of networks and social ties within the village (See Fig. 4.17). Residents documented through photographs, not only their own everyday scarcity, but also captured stories affecting their neighbours and friends. All of these stories were related to the housing situation in Mashimoni, particularly the constant threats posed by eviction, difficult financial situations and exposure to hazards. The following sections discuss the relations that make up this particular condition.



Material

The material relation making up this condition relates to the inability of some residents to secure housing for long periods of time. On the one hand, residents loose or are forced to leave their houses because of risks posed by hazardous construction, activities and weather events. On the other hand, instability may be related to financial constraints to pay the rent, whether because they rely on an irregular income, because of unexpected costs or because structure owners constantly change the rent amount according to demand.



Political

In the event of accidents like fire or collapse of the structure, tenants have no legal right to be rehoused. As plots become vacant and can be rapidly occupied by others, structure owners are usually quick in rebuilding the houses. However, this is accompanied by higher rents, which can be difficult to afford by the current tenant.

Fluctuating rents are another common practice by the structure owners, as competition for housing is high in the area and fluctuates throughout the year. This lack of stability puts tenants in a precarious situation where they can easily be evicted at any time.



Social

Residents, particularly women, expressed their reliance on their fellow neighbours for different reasons, including socialising, keeping an eye on their house and belongings, and for feeling safe when husbands are not around. These social networks and ties are commonly disrupted every time tenants have to move out or loose their house due to accidents.

(b) Lack of adequate and flexible housing: effects across sites of experienced scarcity

The following diagram (Fig. 4.18) shows how in this specific scarcity, all the sites are exerting negative effects on each other, making this case a type of scarcity that is very rigid with no apparent entry point or flexible area at the village scale (experienced scarcity). Based on this, the transcalar diagram of constructed scarcity (see Fig. 4.xx) will expand this analysis across scales, and potentially find areas of flexibility and potential intervention.

Fig. 4.18 Lack of adequate and flexible housing | Effects across sites of **experienced** scarcity

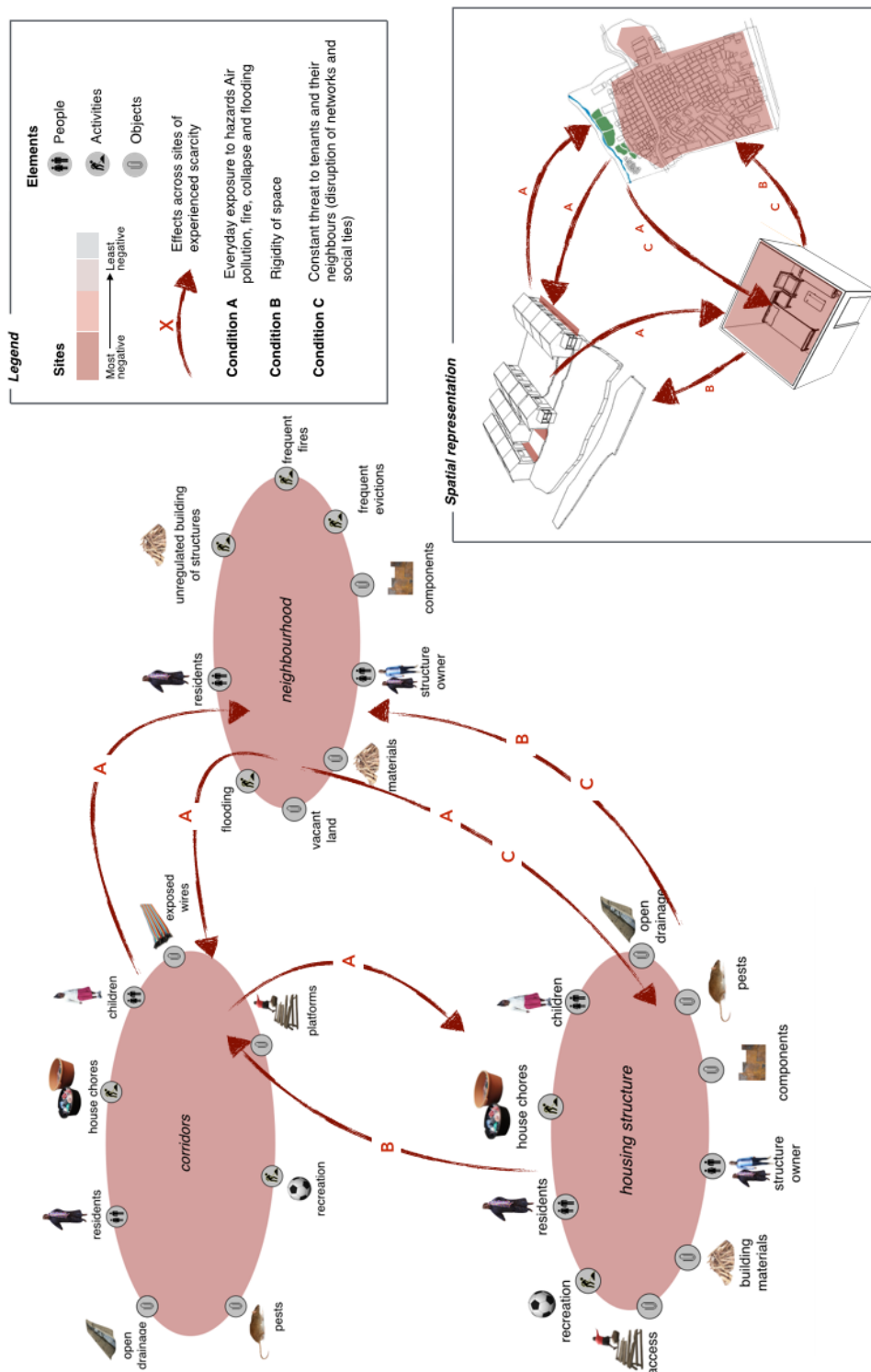


Fig. 4.19 **Lack of adequate and flexible housing** | Constructed scarcity Layer 1: Analysis of issues in the translocal and transcalar diagram according to their material, contextual, political, social, personal and temporal nature

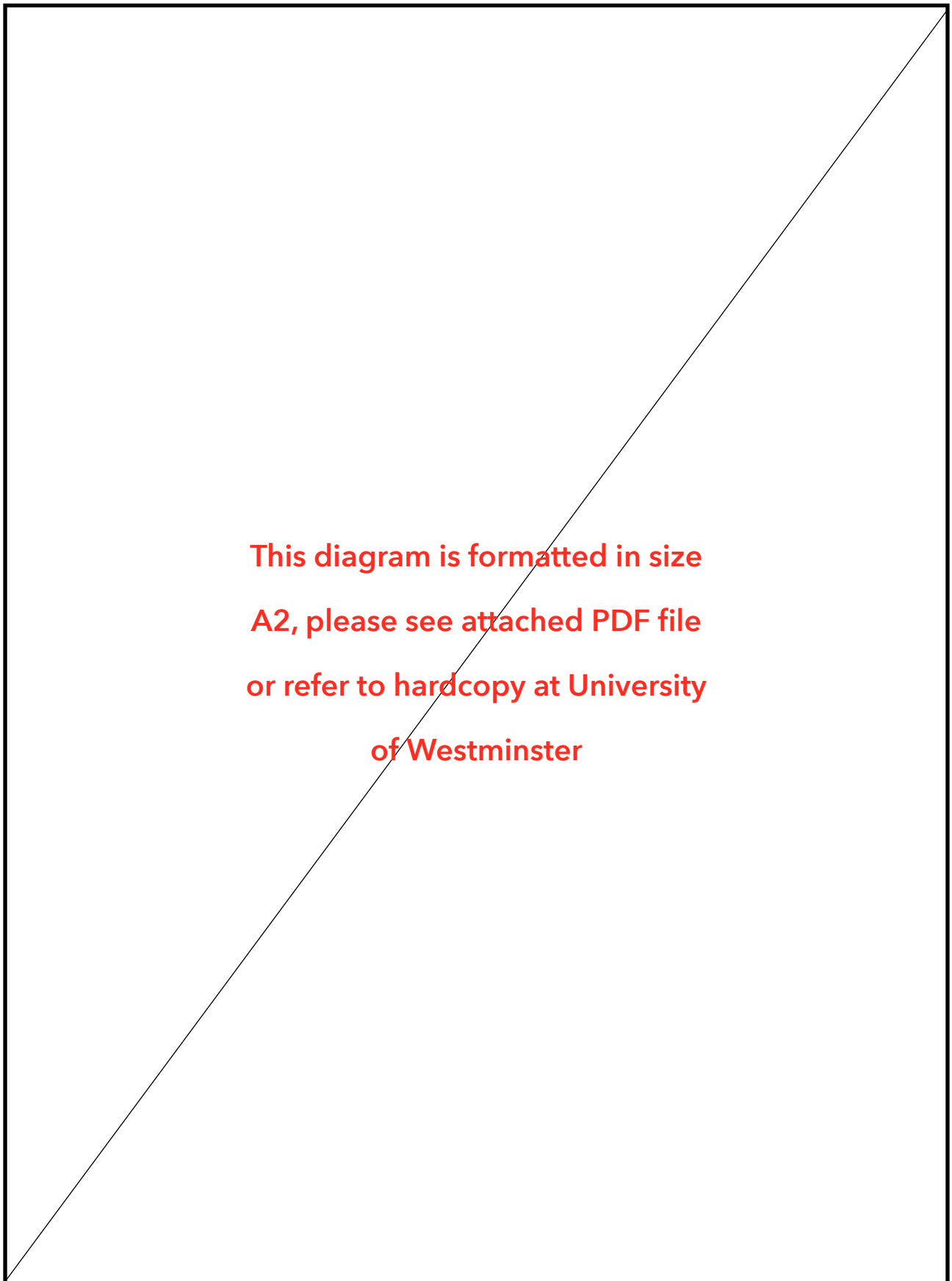
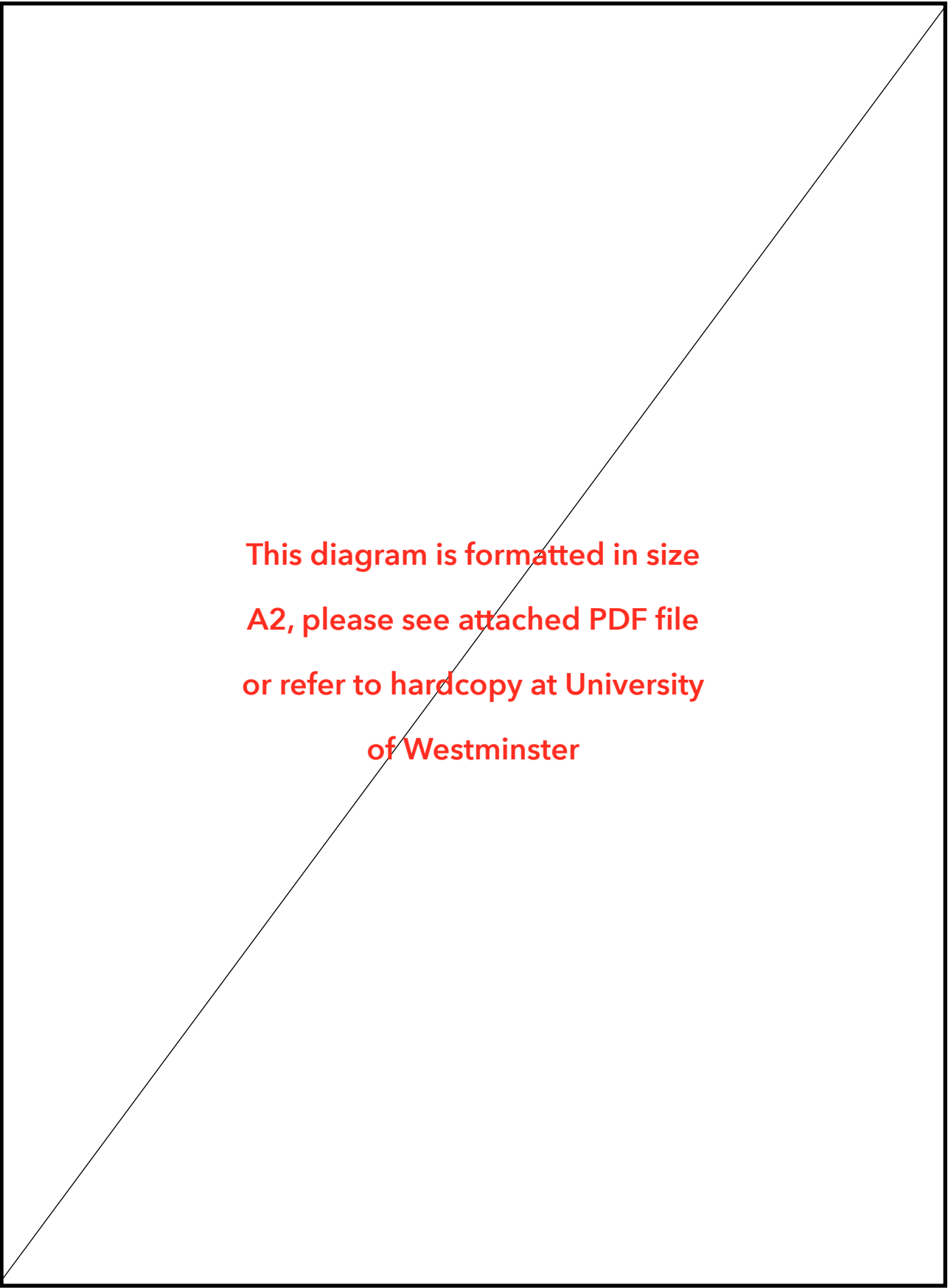


Fig. 4.20 **Lack of adequate and flexible housing** | Constructed scarcity Layer 2: Analysis of key actors, sites and activities in the translocal and transcalar diagram



(c) Analysing scarcity as constructed: translocal and transcalar (key relations and barriers)

The findings from the constructed scarcity of adequate housing are extracted from the diagrammatical analysis in Fig. 4.19 and Fig. 4.20. Housing, in contrast to sewerage, showed how the forces behind the supply and demand, the profit-driven provision of housing, and the control over allocation of land and types of interventions, build a rigid barrier that reinforces scarcity at the local level. Tenants particularly, find themselves with very little they can do to improve the adequacy and flexibility of their home space. Therefore, this study of housing as a constructed scarcity shows how a political aspect, related more to the distributional nature of scarcity, can undermine the mere material solution of just 'providing better housing'. Unless the mechanisms through which structure owners continue to profit from the high demand for housing, and the unclear allocation of land plus lack of regulations, are not addressed, as well as the clarification of the role of the area chief in this process, very little can be done to improve both the experienced of this scarcity within the population of Mashimoni, and the constructed scarcity that has kept Mashimoni in this state for over 50 years.

The political and material were the key aspects emerging from the transcalar analysis across all the conditions created by this scarcity. When it related to the housing situation, a great aspect of it is related to the political aspect emerging from the control on supply and demand, exerted by the structure owners and the Area Chief. The influence of structure owners on the one hand, directly limits what residents can do with the structure they inhabit, and the influence of the area chief directly controls the amount, type and quality of houses built and managed by structure owners, as well as any intervention devised by external actors to aid in the housing situation of tenants.

The material aspect, although it emerged as the most common in the diagram, it refers to the typical description of inadequate housing, including issues with ventilation, materials, rigidity of internal space including overcrowding. However, the diagram of experience scarcity shows the rigidity of this cycle, were very little can change with intervention of the tenants, unless the situation is addressed across the key issues in the transcalar diagram, which are, apart from material, deeply political and to some level, contextual, including the situation of the sewage and illegal provision of electricity.

However, this political aspect is spread out across different scales, starting with the lack of any small scale mechanisms to have some sort of influence on the adequacy of housing they receive (tenants),

all the way to the connections between how the area chief operates and its mandate and connection to the government. This fact, identified and illustrated through the diagram can offer some clues on how to intervene at different scales to address the political aspect of this particular scarcity, which can be useful for the groups already mobilised within the village.

4.3.3 LACK OF ADEQUATE TOILET FACILITIES



Fig. 4.21 An overview of the toilet conditions across Mashimoni

The majority of households in Mashimoni lack of in-house toilets, forcing families to use community facilities and in some cases open defecation or flying toilets. The location and use of these facilities and its spatial impact in the settlement has been mapped by the team of Map Mathare, hence I wanted to explore what were the implications for the everyday life of residents in Mashimoni.

There are several community toilets in the settlement, which are run by different types of organisations or individuals, including churches, schools, private businesses, youth groups and community-based organisations. In order to use these toilets, a person needs to pay at least 3 shillings per time, making it unaffordable for many residents, specially large families. In addition, the vast majority of these toilets are closed at night, from 9pm to 6am, forcing people to use flying toilets or open defecation at late hours of the night. This has several negative connotations, including health risks and safety issues. Women and children are particularly affected, as they expressed their concern on the dangers they face when using these sites during the night, specially in poorly-lit areas.

There are 3 types of community toilets in Mashimoni including long drops built directly on top of the open drainage, pit latrines and biogas. The vast majority of these toilets are poorly designed, with no

adequate provision for children, no separation between men and women and no hand-washing facilities. This situation affects the privacy and safety of the users, specially women and children. It also increases the risk of illnesses related to poor hygienic practices.

However, there are exceptions where toilets have being designed in a more user-friendly way, offering separate entrances and washing facilities. In other cases, the residents' ingenuity has played an important role in improving some of these facilities. For example, the people managing the riverside toilets have placed plastic containers with water hanging from adjacent trees, in order to encourage people to wash their hands properly after using the toilets. Poor maintenance of the community toilets is also a key issue. During visits to several facilities I found out that the maintenance strategies vary widely. Some of the toilets are maintained by individuals, community-based organisations or enterprises, and in some cases, the maintenance is left to the same users. The majority of these practices remain unregulated (specially in the toilets that are ran by individuals). Therefore, although using these toilets comes at a great costs to families, this doesn't guarantee quality of the service or adequate hygienic conditions. Another obstacle for the adequate maintenance of these facilities is the lack or sporadic provision of water, which greatly impedes a regular cleaning and therefore exposes its users and the neighbouring houses to human waste, flies and odours. This affects mostly the toilets run by individuals, as the churches, schools and youth organisations tend to have a water tank that guarantees a fairly regular water provision for cleaning purposes.

(a) How residents live this scarcity everyday? Analysing the elements, sites and relations

Based on the residents' narratives and the analysis (See Fig. 4.22) the following conditions were identified as emerging from the lack of appropriate toilet facilities, listed according to their level of negativity and complexity: a) Poor maintenance and management, b) Poor construction and design, c) Risk in recreational and household activities and d) lack of privacy and dignity

Condition A: Poor maintenance and management of communal toilet facilities

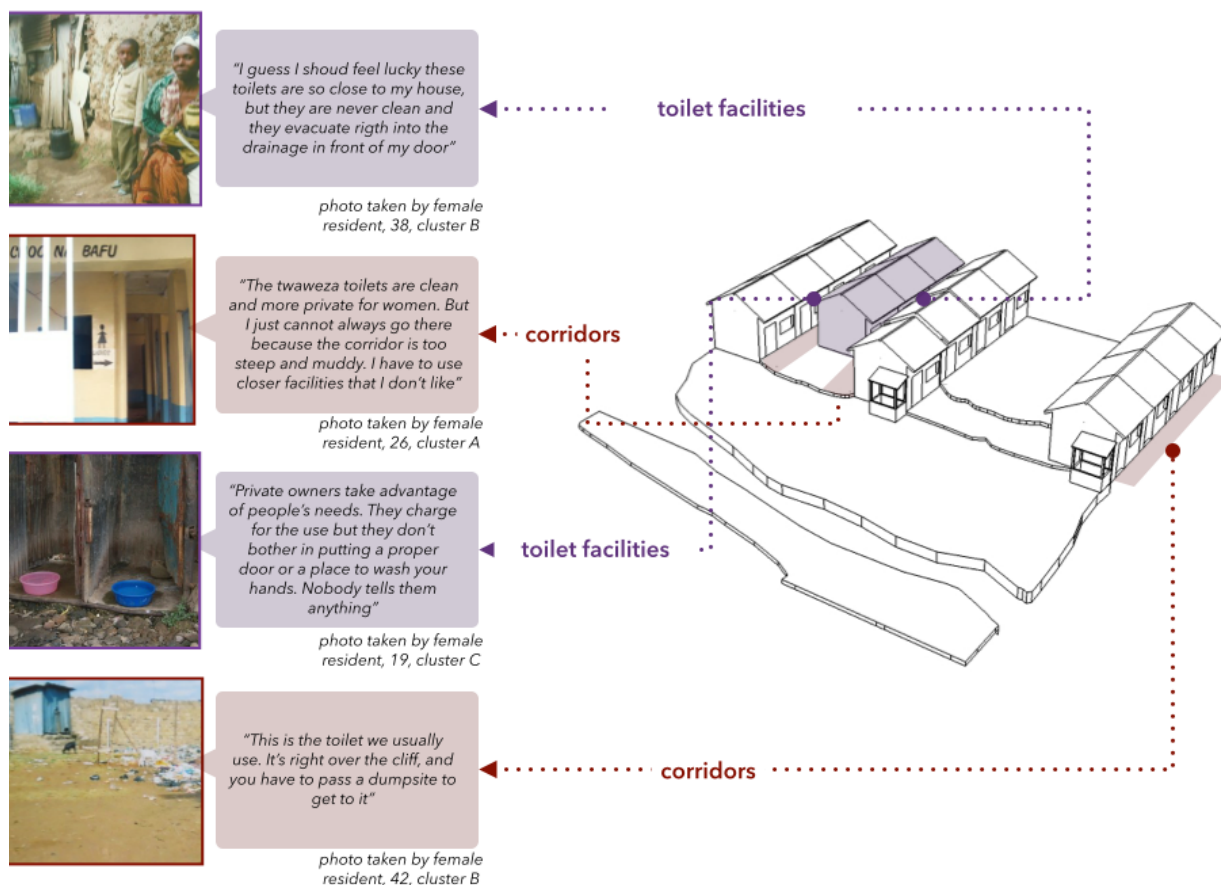


Fig. 4.22 Poor maintenance and management of communal toilet facilities - sites where this condition is experienced and personal narratives

Table 4.8 **Summary of condition A** | Poor maintenance and management of communal toilet facilities

Where? Sites of experienced scarcity	What and who? elements interacting everyday			How? relations between elements that create the conditions	
toilet facilities	residents	components of the facilities	vandalising of facilities		material
corridors	toilet owners	building materials			political
	children	open drainage			social
		solid waste			personal
		schedules			temporal
		water			contextual
		fees			



Material

The material aspect of poor maintenance and management refers both to the physical structure of the toilets, mainly communal, and to the corridors that are connected to them. Firstly, with regards to management, communal toilets often exceed their capacity. Units are overcrowded, putting a strain in the structure themselves, on the evacuating makeshift infrastructure (pipes and connections) and all the way to the corridors that double up as open drainage. This situation is worsened by the unreliable provision of water in the area, which makes it hard to get and expensive. Some community toilets use the fees charged to provide a regular cleaning to the facilities, but this practice is not regulated and therefore, many of the privately-run facilities get away with almost no maintenance or cleaning at all. Others provide gerry cans outside the facilities and a water kiosks, where residents can buy water to clean the facilities before using them. The costs of this practice put an even higher strain in the residents monthly expenses, hence why many of them find as standard practice to use toilets even when maintenance is not ideal or inexistent. This lack of regular cleaning in combination with overcrowding, worsens the condition of the facilities already in precarious state.

According to Map Mathare, only 2 of 9 toilets facilities in Mashimoni are connected to sewage. Residents pointed out that connections are usually poor and remain in constant disrepair, spilling human waste into corridors and in some cases into the front of houses.

Corridors are closely and materially linked to the problematic of toilets in Mashimoni for three reasons: they are commonly used for flying toilets at night, human waste is drained directly into them through long-drop toilets, and any vacant spots that emerge in corridors are often used as temporary toilets. The practice of using a flying toilet at night puts a direct strain in the drainage system that runs through the corridors. Plastic bags used as flying toilets often clog the drainage, and make the maintenance of corridors difficult. Vacant spots can emerge in corridors at any time, due to housing structures being demolished or suffering from fires or collapse. These spots are swiftly often appropriated as temporary toilets, particularly by men passing through corridors, or by women and children at night.



This aspect relates to the high density nature of the settlement, geographic aspects and distribution of the settlement. By 2011, only 8 percent of households in Mashimoni had access to private toilets. The remaining 92 percent has to rely on communal toilets for everyday use. According to Map Mathare, by 2011, there were only 9 communal toilets in the village of Mashimoni, two of those public and the remaining privately-run. The ratio between units and customers can vary from 50 to 500 per unit. Residents reported in their interviews, that they share toilet facilities with approximately 300 other residents. Space is highly contested in Mashimoni, hence is very common that the only private communal toilets are owned by churches and schools, that usually have more access to land. The two biggest facilities in Mashimoni, run by religious organisations, serve between 250-500 customers. This combination of high density settlement, few communal toilet facilities and little space to accommodate more, has a direct effect in the maintenance of these facilities, as they are often strained, and the management staff (care taker) overstretched. The geographical location plays an important role in the maintenance and management. The most important (in terms of size and number of customers) communal facilities are usually located in the flatter sections of the village, commonly cluster A or closer to Mau Mau Road. Residents in the most dense, steep and isolated clusters, i.e. B, D and E have to either walk long distances through difficult corridors in order to reach these facilities, or use the small, private and often more expensive toilets that usually serve these inner areas. The latter facilities are usually located in small spaces, difficult to reach due to steep slopes or large drainages in the way. Owners do not provide any maintenance of access corridors leading to the toilets. Residents expressed in occasions they have to jump trenches to walk to these toilets. This is also applicable to one of the biggest, most used and better equipped toilets in Mashimoni, the Twaweza Communal Toilet, that is located in cluster F. This toilet unit is placed in an area with difficult topography where elderly and children have difficult access too. Based on the analysis of the information, it was clear that access to the facilities was not taken into account in the maintenance and management of them.



Political

The great majority of toilets in Mashimoni are run by private organisations or individuals, with no explicit accountability to any authority within the village. The fact that the demand is high and residents have very limited options, makes it even harder for them to comply with more hygienic and ethical practices in the maintenance and management of the facilities. Residents find themselves with no choice but to use them and with no influence on how these facilities are run.



Temporal

Communal facilities with no exception, close at 9.00pm at the latest. This is a key issue mentioned by all residents as there is the lack of alternatives for women and children at night. When questioned about this decision, some take carers mentioned safety issues and lack of resources as the reason to close facilities after 9pm. This has close relation to the overall lack of street lighting in the village and the conditions of the circulation corridors, which makes it difficult and dangerous for both the customers and the take carer to walk and work at night.



Personal attributes

Management staff and take carers interviewed during the fieldwork, expressed concern and difficulties when dealing with customers in taking care of the facilities and using toilets in an adequate manner. They stressed the need for more education on health risks associated to poor hygiene practices. Vandalism was also mentioned as a factor that difficulties the maintenance of toilets, increasing the bad perceptions of public toilets and its surroundings.



Social

Women and children are particularly affected by the lack of toilets at night. Men reported to use outdoor sites if needed, including the riverside. However, women and children strictly avoid leaving the house after dark, considering that all inner corridors are poorly or nor not lit at all, and the safety implications associated with this, including risk of sexual assault (See Amnesty International, 2010a and 2010b).

Condition B: Poor construction and design

This condition is associated to the current type of provision of communal toilets facilities, including its planning, design and construction (See Fig. 4.23). The relations associated to this condition are **Material, Contextual, Political and Social**.

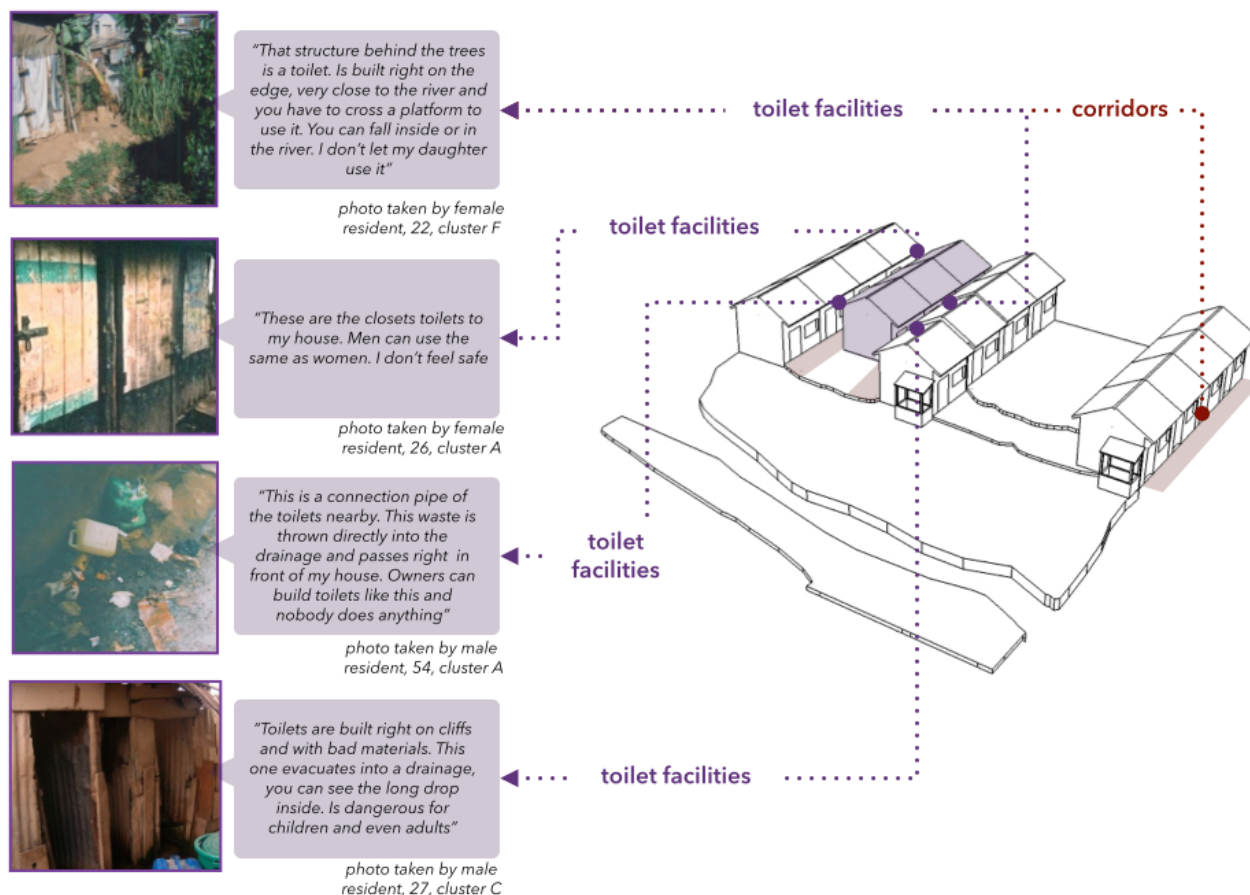


Fig. 4.23 Poor construction and design of communal toilet facilities - sites where this condition is experienced and personal narratives

Table 4.9 Summary of condition B | Poor construction and design of communal toilet facilities

Where? Sites of experienced scarcity	What and who? elements interacting everyday			How? relations between elements that create the conditions	
toilet facilities	residents	components of the facilities	circulation		material
corridors	toilet owners	building materials	house chores		political
	children	open drainage	recreation		social
		solid waste	open defecation		contextual
		platforms	circulation		



Material

The material aspects of the design and construction of toilets in Mashimoni is related to the following issues: The existing rudimentary connections to drainage, the lack of basic facilities for hygiene practices, the lack of consideration for specific needs for women and children and the precarious physical access to the facilities. The problems with design and construction include both purpose-built facilities, and those accommodated within households or private property and land.

According to Map Mathare, only 2 out of 9 of the surveyed facilities have incorporated in the design a proper connection to drainage. The rest of the facilities either evacuate directly into the drainage or rely on rudimentary connections. Moreover, there is a distinct lack of hand washing facilities. The biggest community toilets, ran by churches, schools and youth groups, usually incorporate a gender subdivision, but many of the privately-run toilets do not comply with this. A key issue mentioned by residents is the lack of adequate toilets for children. In most of the cases, children use the same toilet as adults, and become expose to dangers such as falling into pit latrines. In the case of smaller children, parents decide to use flying toilets or vacant areas closer to their houses.

Many of the toilets, particularly pit latrines and long-drops are built with no safety considerations, and become a danger even for adults. During the course of the fieldwork, two female residents involved in the photo voice exercise and follow-up interviews, both residing in cluster B, had to attend a hospital for substantial injuries sustained while using the toilet.

With regards to access to the facilities, particularly with smaller, private toilets located in the inner or isolated areas of the village, are usually built over cliffs, in steep slopes or almost on top of the river. This poses a greater risk for residents and difficulties the access, especially to elderly, disabled and children.



Contextual

Design of this toilets does not take into account an appropriate access that accommodates the barriers impose by topographic features, open and precarious drainage or neighbourhood density, therefore results in difficult and precarious access paths. Vulnerable residents, particularly elderly and disabled, have few alternatives to access facilities, and children have usually to surpass several physical obstacles to access the facilities.



Political

Even through the use of toilets is regarded as the most considerable expense of families in Mashimoni, residents have no power to demand better facilities that incorporate specific needs, particularly for their children. Residents expressed there is no known authority that regulates or supervises the design or type of construction used in these facilities. Communal facilities provided by the government are inexistent in Mashimoni.



Social

Vulnerable groups, particularly women, children, disabled and elderly, are largely not considered when it comes to the design of toilet facilities. This includes the lack of gender separation, the lack of adequate access for disabled and elderly and the use of frequent pit latrines that pose significant risks, particularly to children. This disregard for the needs of the most vulnerable groups, creates a sense of isolation when it limits considerably their choices of services.

Condition C: Risk in recreational and household activities

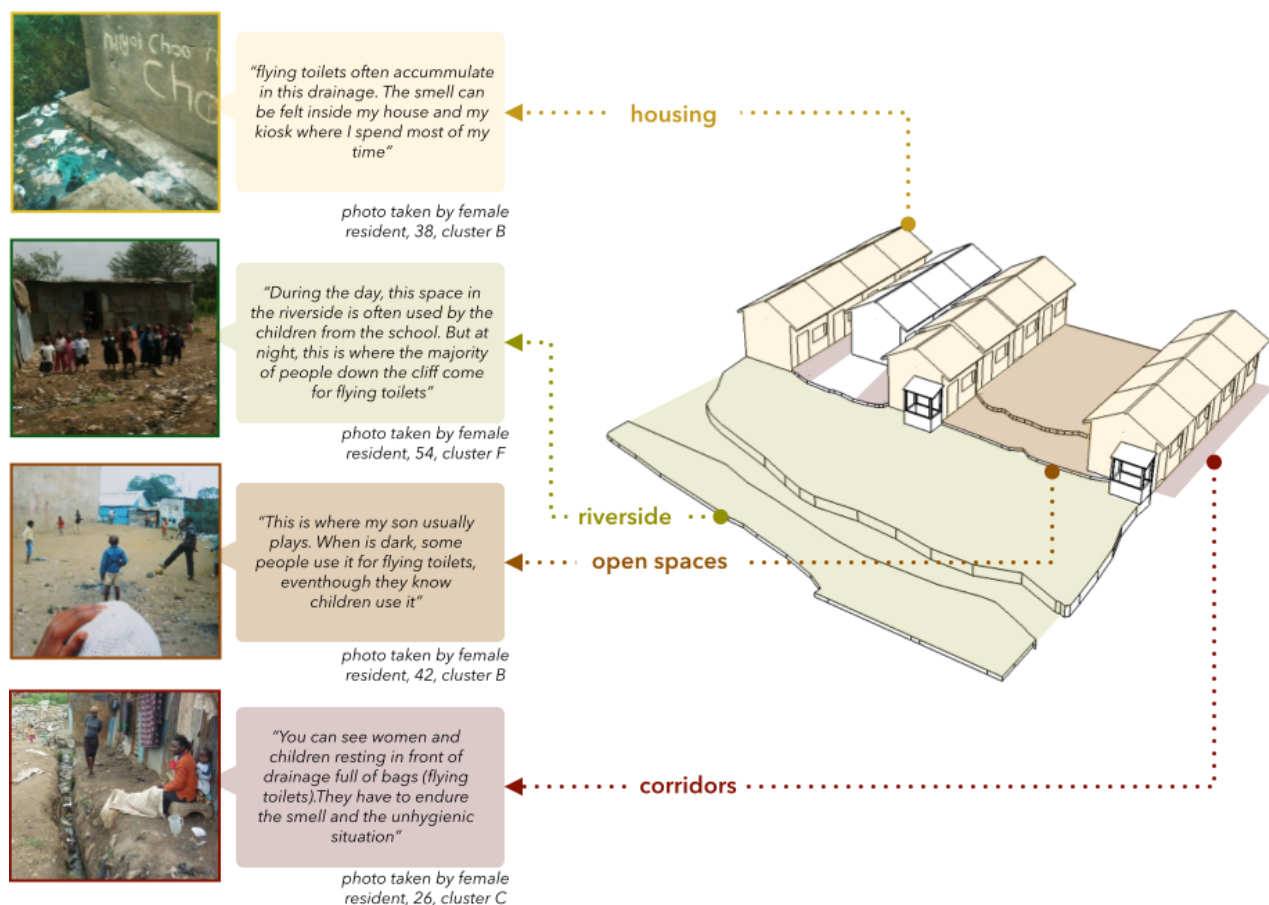









Fig. 4.24 Risk in recreational and household activities - sites where this condition is experienced and personal narratives

Table 4.10 **Summary of condition C** | Risk in recreational and household activities

<i>Where?</i> Sites of experienced scarcity	<i>What and who?</i> elements interacting everyday			<i>How?</i> relations between elements that create the conditions	
					
corridors	residents	components of the facilities	recreation		material
open spaces	toilet owners	building materials	circulation		contextual
riverside	children	open drainage	house chores		social
housing	sellers/ growers	solid waste	selling/ manufacturing		temporal
	customers	produce	open defecation		
		allotments			
		water wells			
		vegetation			
		access paths			
		river			



Material

All the sites of scarcity in question have direct contact with human waste, through toilets draining into corridors and the use of open defecation and flying toilets in open spaces and the riverside. All of these sites are used actively and on a daily basis for both household (corridors as extended house space and open spaces for washing purposes) and recreational activities , as showed in the analyses above. Odours emanating from these practices deter the use of the riverside as a recreational space.



Contextual

The riverside, as the space with most recreational potential due its location and green areas, is particularly affected by open defecation and flying toilets. Residents, particularly men, living in clusters E and F, use the riverside for these practices during the night. At the same time, the location as the final receptor of drainage in the village, makes the riverside highly polluted by human waste. The majority of the human waste from communal and private toilets ends up in the riverside, due to the location, geography and layout disposition of the settlement and its drainage system. This means

that all social activities undertaken in the riverside are always accompanied by exposure to human waste, therefore posing risks to health. High density of the settlement means as well that intimate spaces, usually for household activities will always be exposed to human waste and its effects, particularly when the layout is mainly composed by dense and narrow corridors doubling as drainage, and rows of houses with ventilations and walls that directly open to the corridors.



Temporal

Corridors and open spaces are commonly contaminated by open defecation and flying toilets at night, due to the lack of alternatives.



Social

As mentioned before, corridors, open spaces and the riverside are the only alternatives for spaces for social interaction, particularly for women and children.

Condition D: Lack of privacy and dignity

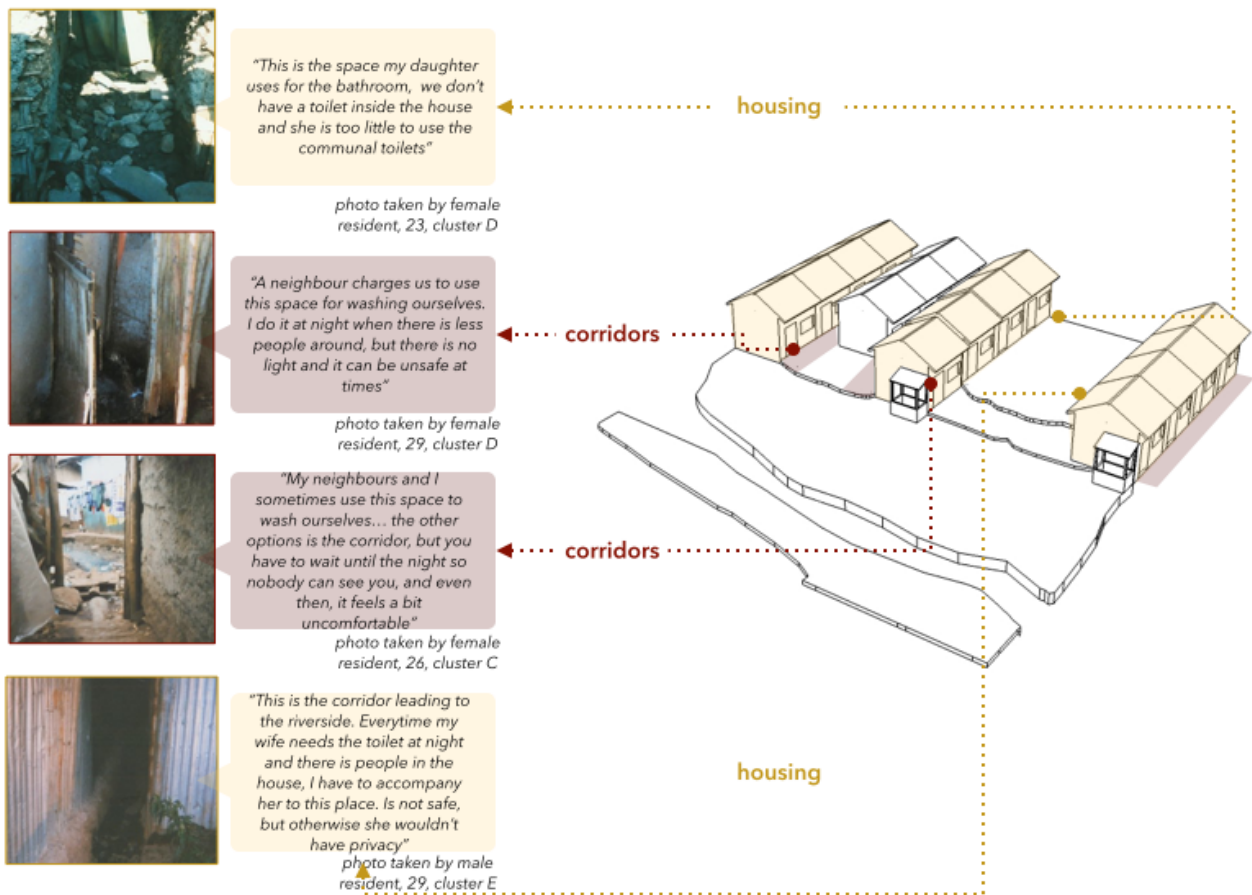








Fig. 4.25 Lack of privacy and dignity - sites where this condition is experienced and personal narratives

Table 4.10 **Summary of condition D** | Lack of privacy and dignity

<i>Where?</i> <i>Sites of experienced scarcity</i>	<i>What and who?</i> <i>elements interacting everyday</i>			<i>How?</i> <i>relations between elements that create the conditions</i>	
					
corridors	residents	components of the house	open defecation		material
housing	structure owners	building materials			social
	children	street lighting			temporal



Material

Residents expressed their concern for the safety and the lack of privacy that involves using any kind of toilets at night. This includes using vacant spots in corridors and using the riverside, as the only alternatives to flying toilets. Issues with privacy include using flying toilets inside the house, considering most of the houses comprise one open space for the whole family. Privacy is also a concern when taking showers in front of the house, protected only by clothes or curtains, or taking showers in makeshift spaces in corridors, usually with precarious doors. Women interviewed expressed their choice is to take showers in the evening in front of their house, when light is not available and people cannot see them, making a highly uncomfortable situation where they have to compromise safety and dignity, for privacy.



Temporal

The issue with not having alternatives at night, means women and children have to resort, in the majority of the cases, to using the house for flying toilet practices. Men do not usually face this problem as they feel safer to go outside during the night, usually to open spaces nearby or to the river. During the interviews, both men and women expressed shame for having to use flying toilets at night, and consider it a non dignified choice they have to make.



Social

As previously mentioned, the dignity, safety and privacy of vulnerable groups is often the most compromised. Residents are continually exposed to dangers, and the lack of appropriate toilets has

a direct bearing in the social unbalance where sectors of the population feel in constant threat and disadvantage in a daily and basic need such as using toilet facilities.

(b) Effects of scarcity across sites: key and most problematic sites

As the diagram illustrates (See Fig. 4.26), once the scarcity is analysed as an assemblage, it is clear that the toilet structures and the housing exert the biggest negative impacts into the rest of the sites. Toilet facilities exert negative effects in all of the other sites, because of their poor design, construction, maintenance and management. This effect makes corridors, open spaces and the riverside, the receptors of human waste coming from rudimentary connections, pit latrines and long drop toilets. Housing constitute the second most problematic site, because of its rigidity, particularly the limits imposed to residents during the night, when they have to resort to open defecation and flying toilets. These practices contaminate further the corridors, the open spaces and the riverside.

At the same time, both problematic sites, the house and the toilet facilities, exert mutual negative impacts to each other, creating a vicious cycle. On the one hand, the rigidity of space in the house puts a strain in the use of communal toilets as only alternatives, and other hand, the management and poor design of toilet facilities forces vulnerable residents to compromise their privacy, safety and dignity by using flying toilets at home during the night.

Furthermore, spaces commonly used for household, social, economic and collective activities are the ones most affected within the assemblages, bearing the consequences of poor construction and design, poor maintenance and management and rigidity of spaces. Corridors are vulnerable due to them being direct receptors of toilets and inadequate disposal practices, and the riverside and open spaces as receptors of all the drainage carried down to the river through the corridors.

Based on this, toilet facilities and housing become the priority areas of intervention to start minimising negatives effects in corridors and open spaces, and subsequently in the residents that use them on a daily basis.

Fig. 4.26 Lack of adequate toilet facilities | Effects across sites of **experienced** scarcity

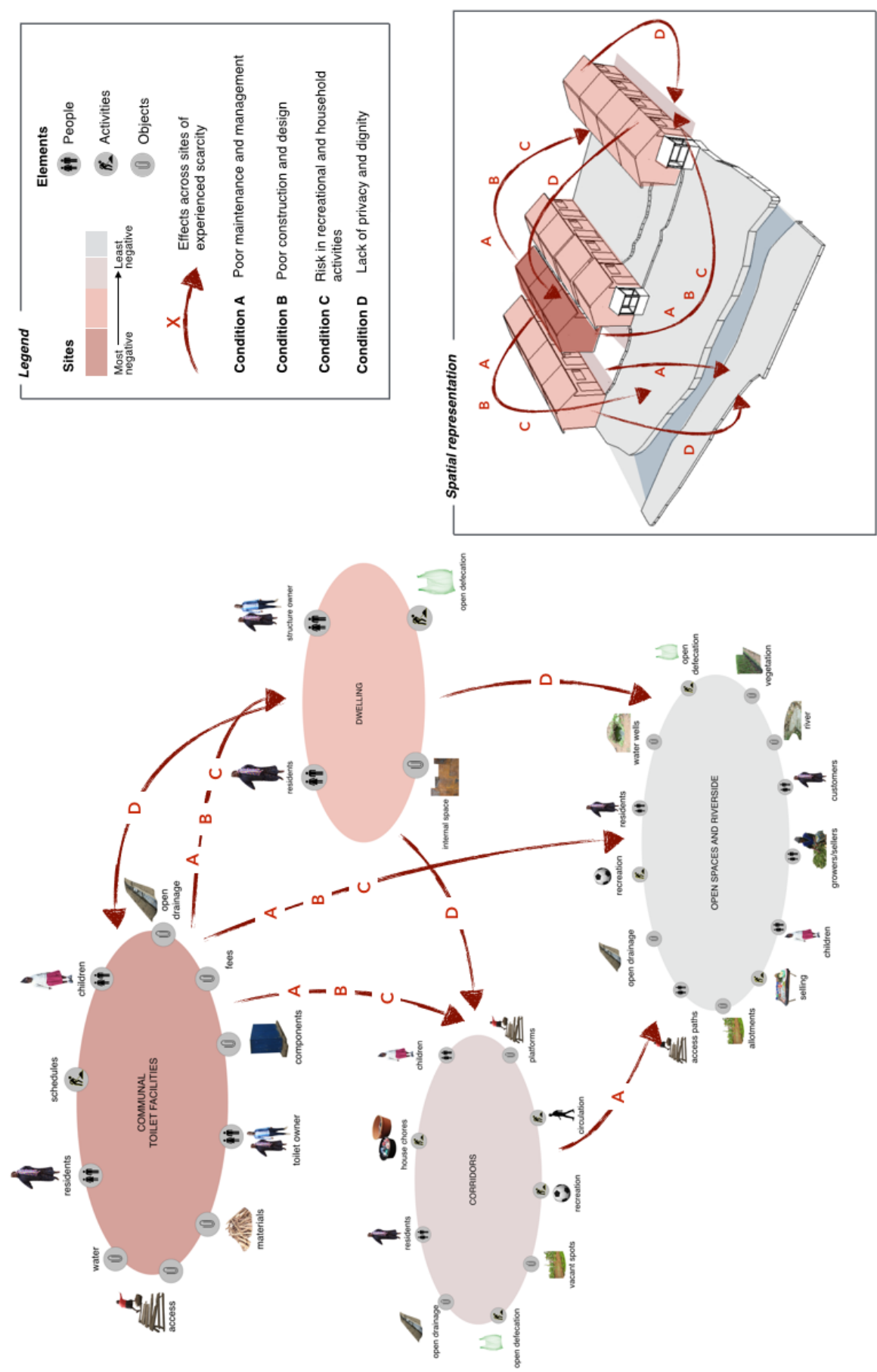


Fig. 4.27 **Lack of adequate toilet facilities** | Constructed scarcity Layer 1: Analysis of issues in the translocal and transcalar diagram according to their material, contextual, political, social, personal and temporal nature.

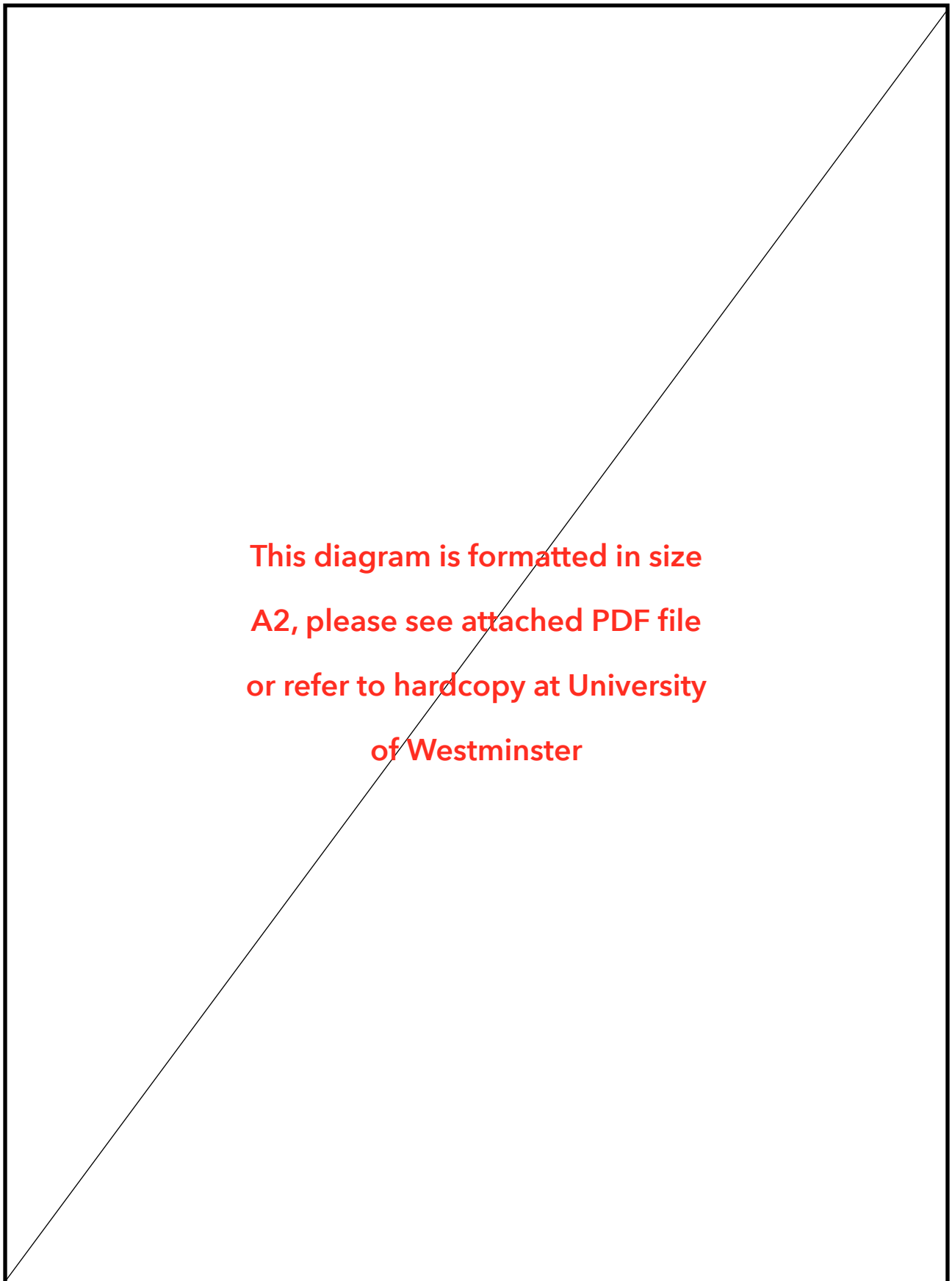
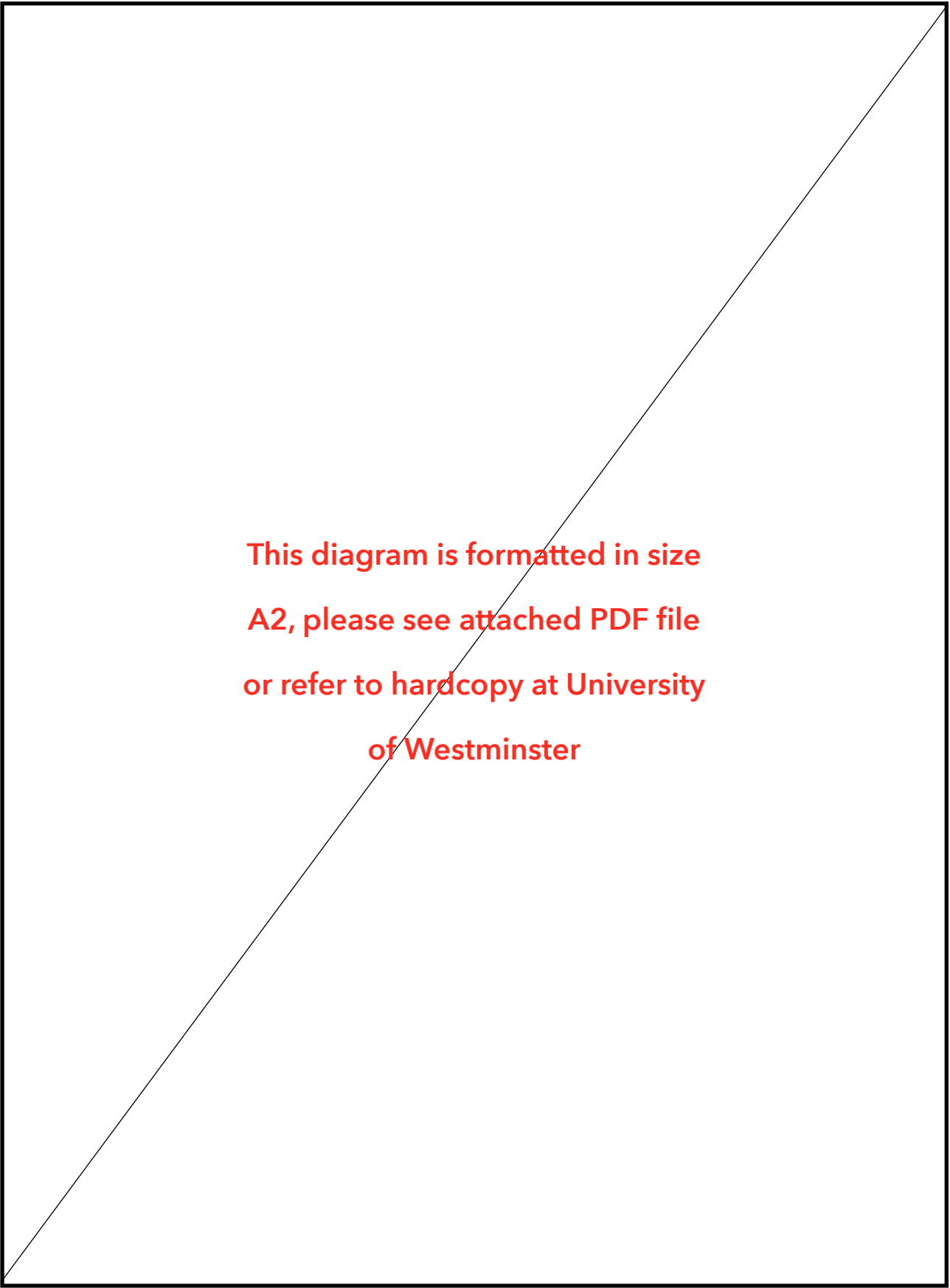


Fig. 4.28 **Lack of adequate toilet facilities** | Constructed scarcity Layer 2: Analysis of key actors, sites and activities in the translocal and transcalar diagram



(c) From experienced to constructed scarcity: translocal and transcalar diagram

The translocal and transcalar diagrams of the lack of adequate toilet facilities were constructed with information from the fieldwork, further interviews, mapping, observation and analysis of secondary data (See Fig. 4.27 and Fig. 4.28). Findings are organised according to the categories emerging from the discursive, distributive and socio-material aspects of scarcity: Material, Contextual, Political, Social, Personal and Temporal. In the case of this scarcity, the key relations that emerged in order of incidence, were **Political**, **Contextual**, **Material** and **Social**

Political

There is a lack of influence that residents have on the provision, maintenance and management of toilet facilities and the human waste practices like open defecation and flying toilets that affect their social and household activities. At the same time, residents have extremely limited choices for disposal of human waste at night, and find themselves with no choice but to resort to these practices, even if there are communal toilets.

The diagram also shows two related key issues: Firstly, a gap or disconnection between processes in the village (i.e. the potential of youth groups and other CBOs as well as partnerships within the village) and processes at the city level (policies that can benefit the residents) and secondly, the concentration of control on few individuals in the village, particularly the Area Chief.

With regards to the former issue, the Area Chief is a key person acting on behalf of the government, with jurisdiction at the settlement level (Mathare) and serving as bridge between authorities and the village (Mashimoni). Hence, he is the appointed facilitator of dialogue and collaboration between residents and the government. However, this position, according to the findings, does not seem to translate into better coordination of initiatives. For example, the Environmental Sanitation and Hygiene Policy NESH (GOK, 2007) made an important recognition of the role of CBOs, NGOs in providing sanitation facilities to informal settlements and, furthermore, included in its action points, the establishment of better partnership strategies to improve provision through these actors. Nonetheless, despite that Mashimoni contains a well organised and mobilised branch of the CBO Muungano wa Wanavijiji Mashimoni and several Youth Groups operating in the area, as well as several long-standing partnerships with NGOs like Pamoja Trust and Plan International, there is only

one physical intervention regarding toilet facilities arising from these actors and their partnership (See Ch. IV, section 4.5 on youth groups and the Twaweza Biogas Community Toilet).

At the same time, one of the findings emerging from the fieldwork and interviews with actors, including the Area Chief, pointed towards a concentration of land allocation into **rental housing**. This constant building of new structures, intensifies the density of the village, and allows for less space for communal facilities, including toilets. It was also evident the influence that churches have in the allocation of land. It is not unusual then, that the biggest toilet facilities, with the exception of the Biogas toilet discussed in Ch. IV, section 4.5, owned and managed by churches. This competition and influence over land was evident during the fieldwork, when inspecting a site dedicated for the first toilet facility to be built by the CBO Muungano wa Wanavijiji Mashimoni. The movement managed to secure a structure to be converted into toilets. During the planning and design process it was evident that a minimum of 2m² were needed to accommodate enough toilet and washing units. However this expansion could not be secured because the church located adjacent to the structure had claims to the space and planned to expand, blocking any options for negotiating the 2m².

Another key issue highlighted by the diagram is that the main providers of toilet facilities in Mashimoni are churches and private owners, as there are no state-funded units in the village. Nonetheless, there is no channel of communication between the main providers and the government, even though the NESH (GOK, 2007), includes in its priority actions the appropriate training of private owners and operators of toilet facilities. This is a particularly important point, as the diagram shows it is one of the critical areas to address. The gap showed in the diagram could be translated into a gap on the implementation and communication channels.

On the other hand, at the National level, the KISIP programme is in charge of providing and upgrading infrastructure for informal settlements. Nonetheless, according to its requirements, Mashimoni is not eligible due to its stagnant land tenure process. The programme however, does include in its actions the procurement of land tenure for the beneficiary settlements, however, Mashimoni, as a village within a settlement, with specific constraints (land owned by Ministry of Defence), cannot access this type of assistance. This constraint is mainly because of the small-scale of the village in comparison to other settlements. Furthermore, as stated before, the Ministry of Defence

has continuously avoided putting in place an option for securing some type of land tenure in Mashimoni.

Another key issue is the lack of formal building standards for communal sanitation units. For example there is a precedent for these this type of regulations, including the Water, Sanitation and Hygiene Promotion on the School Compound and the National School Health Policy 2009 that specifically outlines standards for toilet blocks within schools.

As explained before, private owners are the main investors and managers of toilet facilities, nonetheless, one of the key blockages that emerged throughout the analysis was the lack of accountability mechanisms that ensure that residents can give feedback and exert some action in the way toilets are built and maintained. This lack of accountability is linked to the lack of dialogue between government entities such as the MPHS and the NCC, the Area chief and private operators.

During the interview, several residents expressed their wish for community-managed toilet facilities, however, there seems to be no incentives or channels for securing funding and encourage these type of initiatives.

Contextual

The contextual aspect is based on the fact that informal settlements like Mashimoni, with no clear passage into achieving land tenure, lack a legal standing that can include them as beneficiaries of state-led service provision projects. In this case, the government guidelines are just required to highlight the needed reforms, and to propose an adequate approach for specific problematic cases (NCWSC - AWSB, 2009). In the same line as KENSUP and KISIP, only those informal settlements whose land tenure can be procured or some sort of security achieved, can benefit from its programmes. This means that the guidelines and programmes envisioned within these frameworks, rarely project the reality of villages like Mashimoni.

Material

The material aspect, as illustrated before, is related to the low quality of building materials and techniques prevalent in privately owned toilet facilities, the lack of regular maintenance of facilities, access corridors and drainage pipes.

Social

The key social aspect refers to the lack of consideration for specific design needs for women and children and the overcrowding conditions that make using the house for bathing and toilet a social problem.

(d) Initial lessons for the built environment (key sites, elements and actors)

Key actors: NESH, Area chief, private owners, women and children, NGOs and CBOs, caretakers

Key sites: Communal facilities, clusters BDE, shower facilities

Key elements: land, policies, building standards

Key activities: collaborative interventions

Toilets were a particular case in this study, mainly because it is the only scarcity that includes physical interventions by other local actors. For example, with regards to sewage and housing, there were no substantial interventions by other actors apart from the structure owners themselves (in the case of housing) or individual, small-impact interventions by residents (in the case of sewage). In contrast, communal toilets were a common intervention mainly by private owners, but also by community based organisations like youth groups and coalitions between NGOs and residents. Hence, this scarcity gave the opportunity to observe a rather different diagram, that assessed the role of these interventions in the construction of scarcity itself. This scarcity is also particular, because it is the only one that has clear regulations already designated by the pertinent authorities, hence there was the opportunity to study the discursive aspect of it in more detail and explore how the formulation of these regulations, programmes or policies influence the construction of scarcity in informal settlements with the specific characteristics of Mashimoni.

In this line, the lessons that emerged are related more to the **political** and **contextual** aspects. In contrast to the other scarcities previously discussed, the political aspect of how the provision of toilets is controlled and managed, the power exerted by the area chief and the lack of fulfilment of its role as a bridge between residents and authorities and programmes, the power of churches and private owners of toilet facilities, and the contextual aspect that impedes Mashimoni to receive substantial assistance: the fact that it has no clear passage into land tenure and therefore the majority of programmes are not relevant to the area. But the contextual aspect also refers to the disparities of

provision within the village, that maintains some clusters and areas more affected and isolated from any kind of provision.

This scarcity and its analysis as constructed showed how, even when there are interventions and pertinent policies, it is the way these interventions are implemented and managed at both local and government level, that is key to the beneficial effect in the experience of scarcity by the residents and its construction at different levels. However, in the same way as in sewage, it shows this political aspect runs across different scales, and therefore, has the potential to be addressed by small interventions that are strategic in addressing the key aspects of the construction of this specific scarcity. This is evident in the list of key actors, that include government entities, to caretakers in the village. As well as the inclusion of specific clusters that already give a direction to where the problem can be addressed more strategically.

As long as the provision of toilet facilities is uncontrolled and profit driven without a social component and strategically focused on particular aspects of Mashimoni, residents will continue to utilise precarious and undignified facilities.

The **political** aspect is concentrated, as stated above, in how decisions are made around the allocation of land for interventions. In Mashimoni, the lack of accountability and control of how private owners operate and the lack of enforcement of existing guidelines for maintenance and implementation. users have no influence on owners of communal / private toilets,

The **personal** aspect is concentrated in the lack of capacity of government entities to utilise the existing resources in the shape of CBO and NGOs actions, to implement and deliver the existing policies and programmes.

4.3.4 LACK OF ADEQUATE WASTE MANAGEMENT



Fig. 4.29 An overview of the waste management conditions across Mashimoni

Currently there is no official dumping site in Mashimoni. There is also no regular waste collection service by the City Council. Most people throw their waste either into the sewage trenches or take it down to the river or to the dumpsite in the riverside. There are many community-based organisations and youth groups which collect individual household's waste for Ksh 10 per week. However, according to a 2012 survey, only 33% of households reported using these organised waste collection services (MUST et al., 2012). The remaining have only the option of throwing it in unofficial dumpsites or by the river.

These groups also remove the waste from the sewage trenches and from some of the informal dumpsites around the neighbourhood. They collect, sort and recycle what they can. Initially, the waste would be collected and disposed in Juja Road. However, this practice is currently penalised by the City Council. This forces the cleaning groups to dump the waste into the river. The City Council's garbage truck can collect the waste but this comes at a price (between Ksh 1,000-3,000) that is usually unaffordable for both the residents and the organised cleaning groups. Furthermore, the issue with garbage is deeply-connected to the lack of proper sanitation infrastructure as it causes sewage to clog and flood neighbouring houses and communal spaces. Some residents and representatives of the cleaning groups also expressed how the lack of awareness within the community seriously hinders the initiatives that try to deal with this issue. They also noted how the issue is highly complex and in order to be tackled it requires the active dialogue and participation of the residents, the community groups and the City Council.

Nonetheless, there exists many opportunities for change with respect to garbage. The youth groups are a clear example of the use of collective action and entrepreneurship for the benefit of the community. And although they face many challenges, they are well organised and regularly collaborate with other groups within Mathare. Some of them also attend regular meetings with the City Council in order to negotiate a feasible garbage collection mechanism. They also organise themselves for the “Cleaning Day”, an activity that is organised every month, bringing together several youth groups to clean the dumpsites and sewage trenches in Mathare, including Mashimoni

(a) How residents live this scarcity everyday? Analysing the elements, sites and relations

Condition A: Continuous emergence of temporary dumpsites

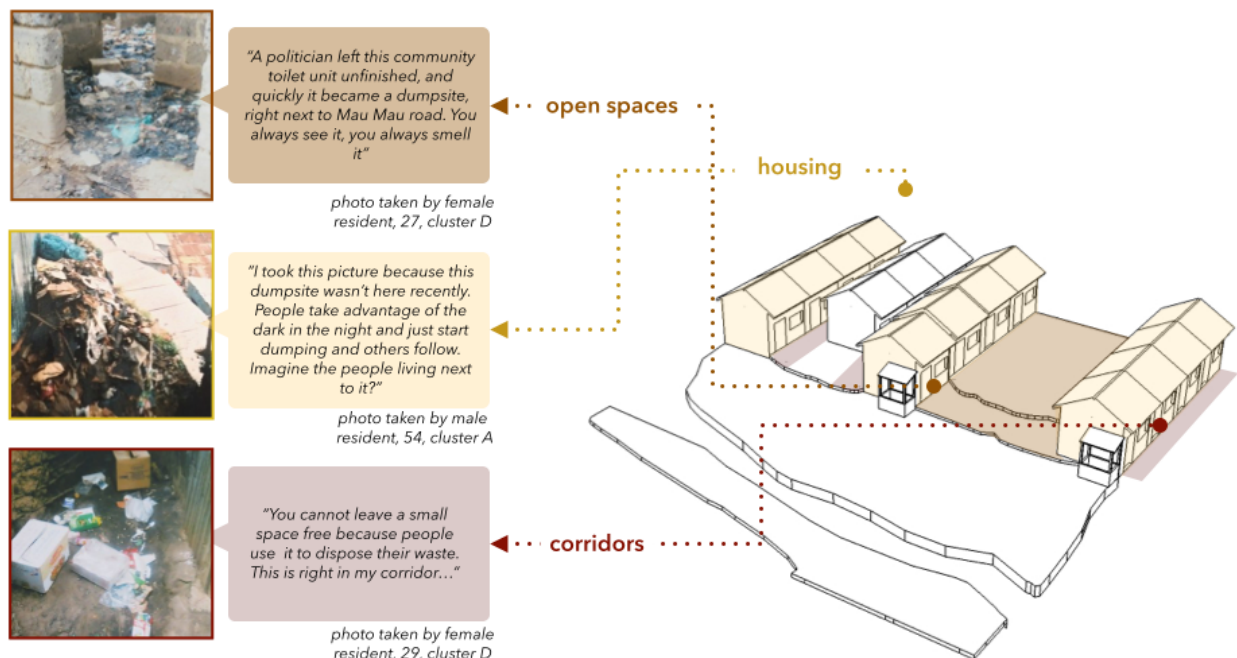


Fig. 4.30 Continuous emergence of temporary dumpsites - sites where this condition is experienced and personal narratives

Material

The material aspect of this condition emerged when discussing the frequent accumulation of waste in key circulation and recreational open areas, including spaces that are left temporarily vacant. There are no official designated dumpsites within the village, hence solid waste accumulates in both unofficial dumpsites like the riverside and Juja road, and in temporary vacant areas like corridors and open spaces.



Contextual

Temporal vacant areas are rapidly contaminated by waste because of the layout and density of the settlement. The spatial arrangement of the village, composed by a cliff, a high slope and small corridors connecting badly drained open spaces and the riverside, means that all the waste gets accumulated in key circulation and recreational areas.



Personal attributes

There is a widespread lack of awareness and proactivity on better disposal methods from individuals, groups and businesses. There is also a strong demotivation within individual residents to engage more proactively with waste management, due the lack of commitment from municipal authorities and other residents alike.

Condition B: Difficulty in maintenance or circulation areas

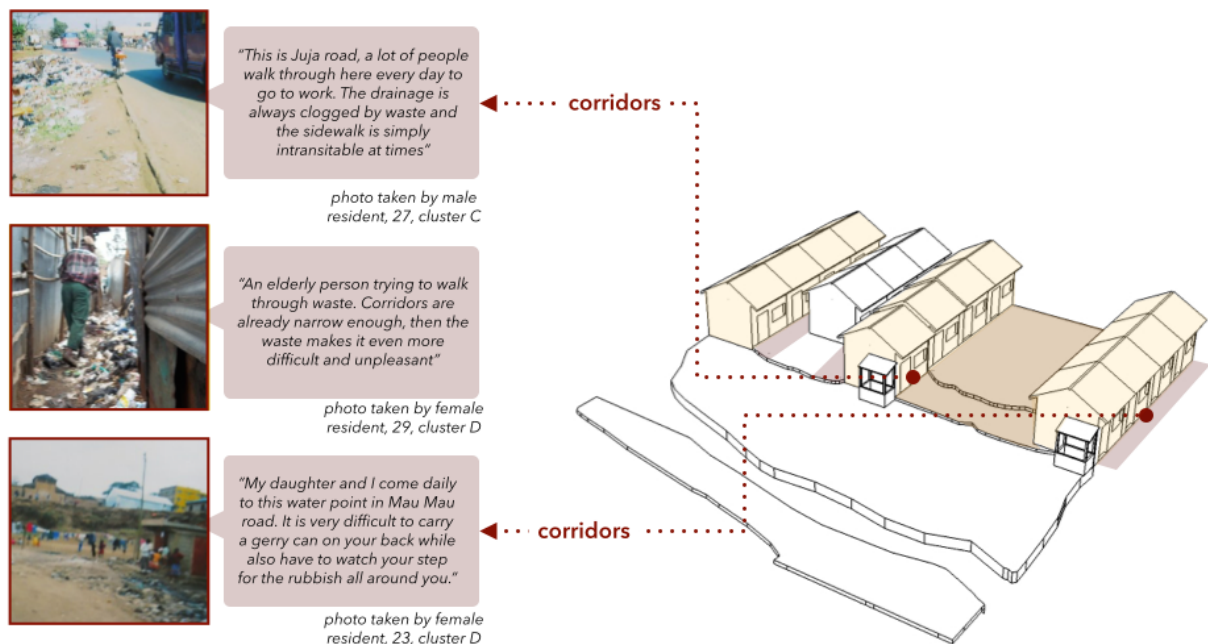


Fig. 4.31 Difficulty in maintenance or circulation areas - sites where this condition is experienced and personal narratives



Material

This aspect is related to the accumulation of household and commercial waste in specific sites within the village, and that impedes the adequate and safe circulation and mobility of the residents. Interviewees mentioned these aspects when discussing daily chores such as carrying water, daily recreational activities like meeting friends or playing and overall circulation within the village. Waste

is usually accumulated in open spaces, specially those poorly lit and less frequented at night, such as the riverside, the football pitch, the edge of the cliff close to cluster B and above cluster D, and any vacant area that emerges spontaneously. This accumulation is related to residents using these spaces as dumpsites, the lack of regular garbage collection either private or from NCC, and to the current draining system channeling waste into these sites coming from as far as Juja Road, a heavily transited road, and the Air Force grounds.

Corridors on the other hand are affected in terms of mobility and circulation due to accumulation of solid waste during the rainy season. Drainage trenches are usually open accumulating solid waste from households and heavy commercial and industrial waste from business along Juja Road. Drainages, usually made out of earth and occasionally of cement, are not designed, in terms of percent slope and size, in any way to deal with the flow that surfaces during rainy season and usually spill into the rest of the corridors and roads. The lack of street lighting also facilitates dumping activities in such sites. Likewise, the high volume of solid waste damages platforms in corridors.



Contextual

The contextual relation of this issue, is related to the location and the geography of the settlement. As described in Ch. IV, section 4.2.2, Mashimoni has a complicated geography with a cliff and a strong slope that leads to the river. Along Juja Road there is a large cement drainage that collects waste from the road, pedestrians and especially, from the businesses located along the road, in cluster A. Although, the NCC has forbidden the dumping of waste in this area, it is mentioned by residents as a strategic place to dump waste at night, when no one can see or report you.

The solid waste accumulated in this area difficulties the circulation in this heavily transited sidewalk, but most importantly, an amount of this waste is transported through drainages across the village and deposited in all the spaces it encounters in the way, i.e. vacant spots, pot holes in the drainage system and corridors, open spaces and eventually in the riverside. The geography also facilitates the clogging of the drainage, resulting in spilling overs into the aforementioned spaces.

Its location along a main traffic artery such as Juja Road and the fact that Mashimoni contains one large sewage line coming from the Air Force grounds, puts a substantial strain in its capacity to deal with solid waste.



Personal attributes

Even organised waste collection groups use the aforementioned problematic sites for waste disposal. Only in specific Mathare-wide cleaning events they use the waste collection truck at a cost. Otherwise, this waste is also disposed along the river in a designated area or along Juja Road.

(b) Lack of adequate waste management: effects across sites of experienced scarcity

The following diagram (Fig. 4.32) shows how in this specific scarcity, the corridors become the site with most negative impact in the rest of the settlement. As the corridors double-up as open drainage, they become the conduit through which solid waste enters the village and gets accumulated in open spaces and vacant areas. At the same time, the front of houses in the village become highly affected as corridors are extremely narrow, hence houses are usually in close proximity to the open drainage carrying solid waste. Hence, corridors directly affect open spaces, housing and the riverside.

Open spaces within the village are commonly used as temporary dumpsites. At the same time, they usually have no drainage system, and the high slope of the area means that all the solid waste accumulated in them re-directs to the riverside due to the topography and layout of the village.

Fig. 4.32 Lack of adequate waste management | Effects across sites of **experienced** scarcity

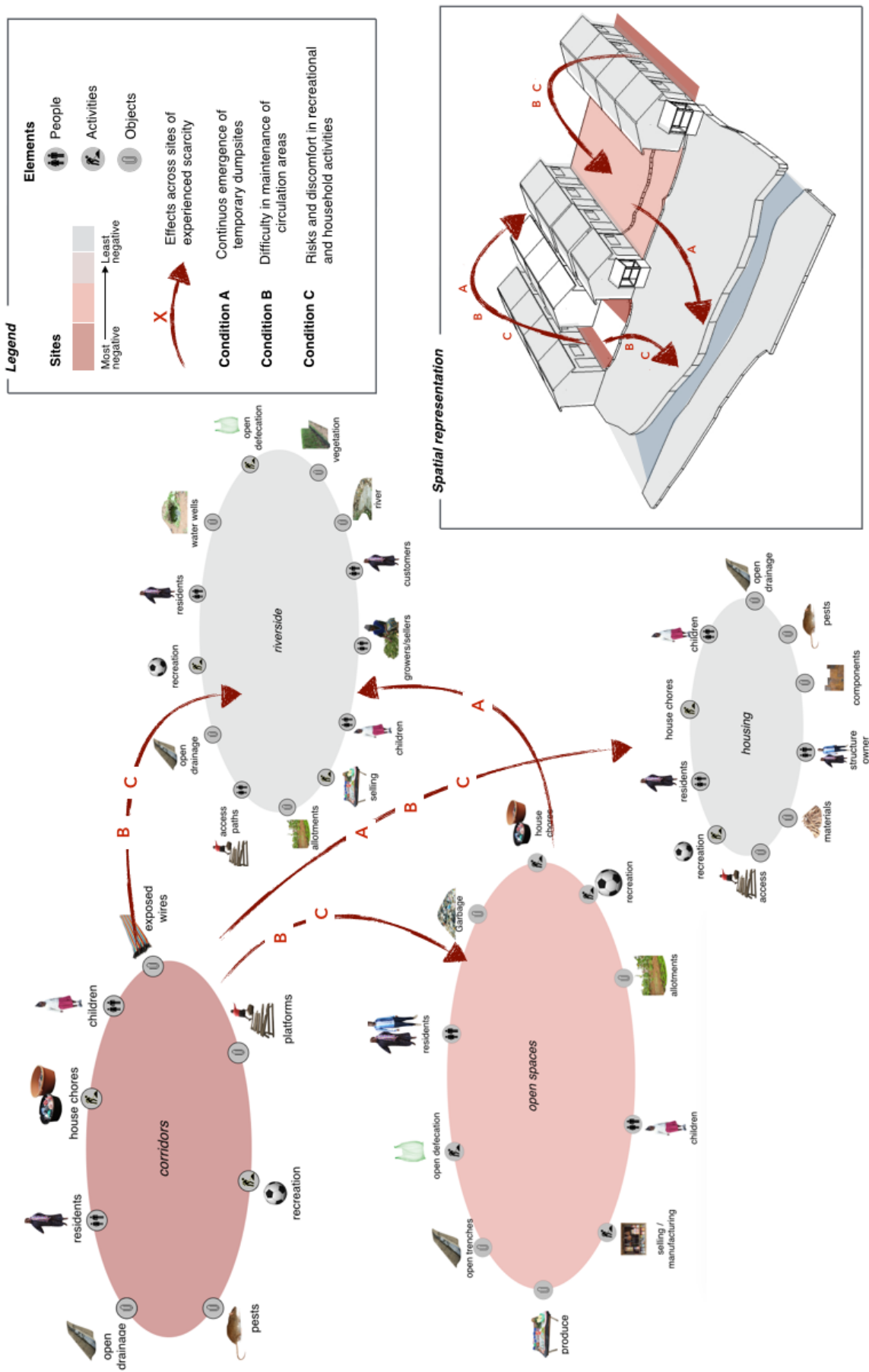


Fig. 4.33 **Lack of adequate waste management** | Constructed scarcity Layer 1: Analysis of issues in the translocal and transcalar diagram according to their material, contextual, political, social, personal and temporal nature

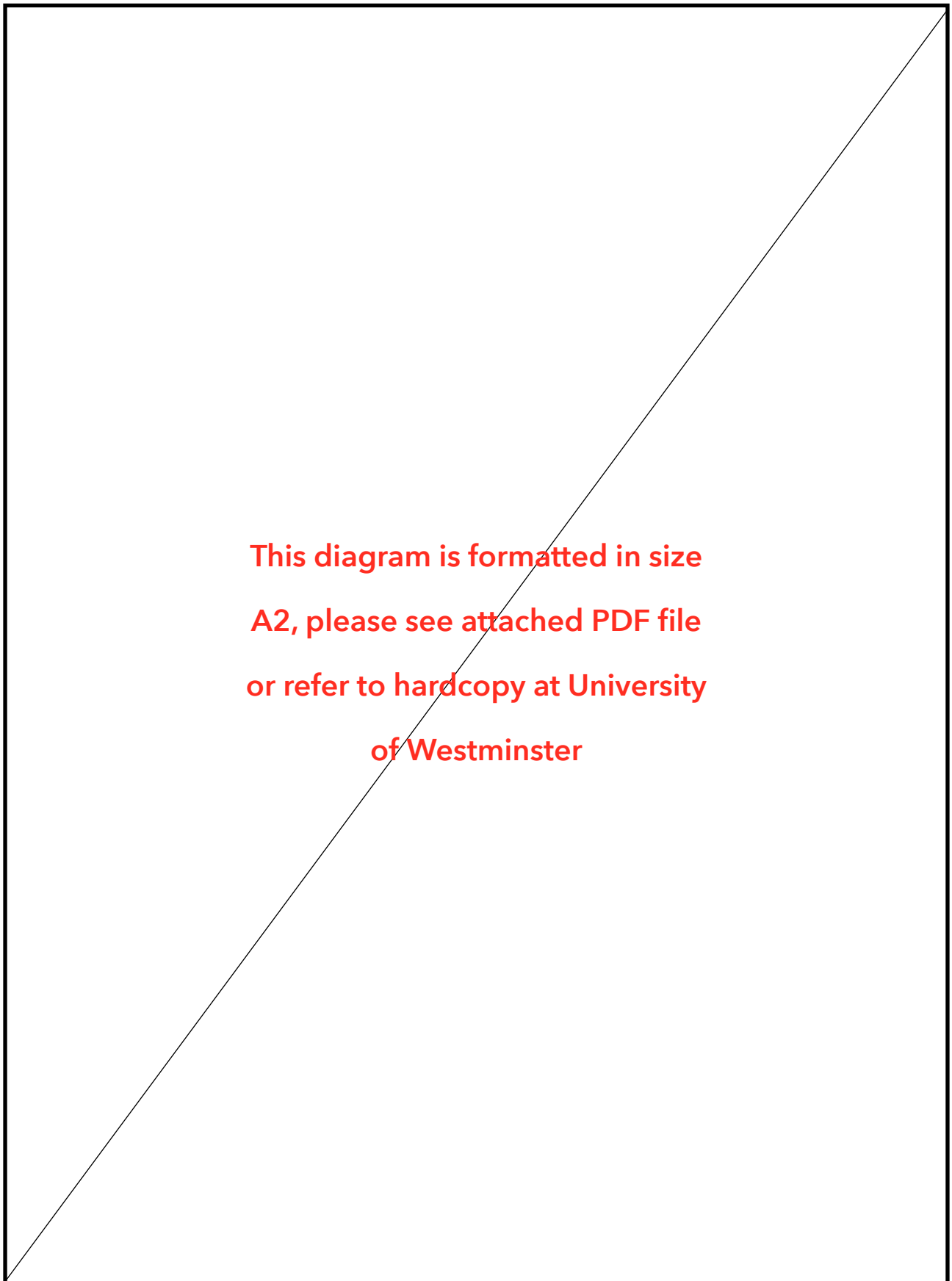
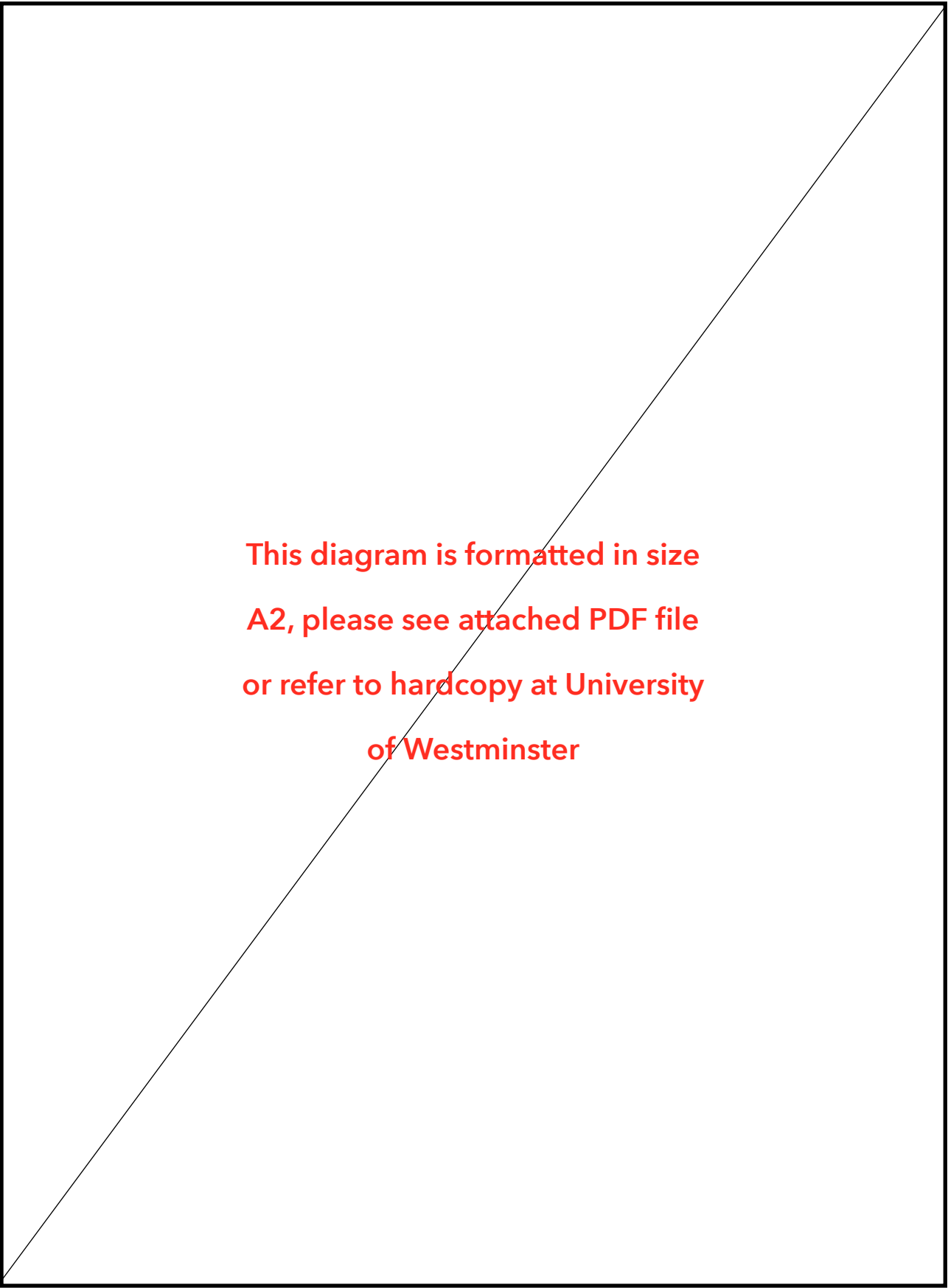


Fig. 4.34 **Lack of adequate waste management** | Constructed scarcity Layer 2: Analysis of key actors, sites and activities in the translocal and transcalar diagram



(c) Analysing scarcity as constructed: translocal and transcalar (key relations and barriers)

The findings from the constructed scarcity of lack of adequate waste management, were extracted from the translocal and transcalar diagrams (See Fig. 4.33 and Fig. 4.34). The material and contextual aspects emerged in parallel, as the lack of waste collection from the authorities and the lack of a designated dumpsite were clearly key aspects of the problematic. Moreover, the fact that the majority of residents cannot afford an alternative collection service like the one offered by youth groups, puts a direct strain in the occurrence of indiscriminate waste disposal in all areas of the village. Moreover, Juja road and the riverside constitute the main informal dumpsites within the area. The key location of these areas plays an important role in reinforcing this particular scarcity. Juja road is located at the main access point at the top of the cliff, with an open drainage that connects directly to the main sewage line crossing Mashimoni (see Ch. IV, section 4.3.1 and Fig. 4.5). On the other hand, the riverside runs along 100m bordering two clusters (D and E), a school and several communal allotments. These key contextual aspects (the key locations) means that a percentage of the accumulated waste finds its way back into the village through the main sewage line and its surroundings, making it a vicious cycle that maintains the village constantly riddled by waste.

Furthermore, this scarcity was the one with more diversity in terms of relations or aspects, beyond the material and contextual, as it included a substantial amount of personal aspects that helped construct the scarcity. This includes, as mentioned above, the lack of awareness or indiscriminate waste disposal (including hazardous disposal techniques) by residents and even the organised groups intervening in the scarcity, which plays a key role in the vicious cycle assisted by the contextual aspect.

Hence, the analysis of this scarcity as constructed shows how the personal aspect is key to address if a vicious cycle needs to be stopped. Interventions cannot rely only on material aspects, like collection services, but also has to address the happenings in the surrounding areas, the influence of the sewage problem bringing waste back into the village, and the lack of education and awareness within the population.

PART II - DECONSTRUCTING EMERGING TACTICS UNDER CONDITIONS OF SCARCITY IN MASHIMONI

This section will introduce the tactics that emerged under conditions of scarcity in Mashimoni. After introducing the tactics, this chapter will apply the assemblage and diagrammatic approach to subsequently juxtapose the findings into the scarcity assemblages developed in chapter IV. It will do so with the objective to identify which aspects of the constructed scarcity are addressed and how, and at the same time which aspects are neglected. This analysis of emerging tactics, in line with the methodology, will also address the micro scale of 'experienced scarcity' with the transcalar reading running in parallel. This juxtaposition will also allow an examination into the relation between scarcity and creativity, assessing the tactics according to the framework of reactive, transformative or revolving trigger, as introduced in chapter III.

4.5. YOUTH GROUPS AND THEIR IMPACT ON THE BUILT ENVIRONMENT



Fig. 4.35 Overview of youth group activities and interventions

Although there is a long history of community based organisation in Mathare, the biggest wave of youth active involvement came after the events of the post-election violence between 2007 and 2008. This event, marked by volatile and violent encounters and tensions between two different ethnic groups, made a strong mark in young people in the village. The aftermath of the violence brought a state of fear and uncertainty, particularly food scarcity, fewer employment opportunities and lawlessness. But at the same time, significant events started to happen that young people,

without anything to do, saw as an opportunity. Pieces of land, particularly close to the riverside remained vacant for several months. This opportunity along with the pressing need for food, marked the inception of small groups of young people coming together to cultivate the land in order to both meet the food requirement and make profit in the process.

During the duration of the fieldwork it was possible to observe the operation of some of these groups and in some cases , the inception of new ones (see Fig. 4.36). Some of these groups were created around the activities of urban agriculture and started their activities by occupying vacant pieces of land or abandoned infrastructure. Other groups started mobilising around the issue of waste management, which entails a combination of door-to-door waste collection and cleaning of open drainage.

The youth leaders explained that during the inception period, most of the groups do not ask permission to appropriate land or start organised activities like waste collection, however they record their activities, such as attendance of members, profits and investments to substantiate a formal request to the area chief and subsequently register.

A key aspect of the youth groups, particularly with spatial tactics like waste collection, is the use of territoriality. Once more youth groups started to emerge and competition over coverage of areas was leading to conflict, youth group leaders agreed to work based on territories. At the moment, youth groups usually serve specific areas of the village and there is a tacit agreement that newer groups should respect that dominion.

Furthermore, in the last year, there has been a tendency to network and collaborate more directly, not only within Mashimoni but throughout Mathare as a whole. This includes a highly organised monthly cleaning event, the procurement of networking meetings between different villages, and the inclusion of advocacy in their agenda. To support this networking, there has been a process of formalising a representative platform of youth groups across Mathare. They have been able to meet with Nairobi Council and the Environmental office, to discuss issues on waste and sanitation.

Fig 4.36 Youth groups active in Mashimoni and their various interventions

YG	Urban agriculture	Sanitation	Waste management	Animal keeping	Other activities
Riverbank				N/A	N/A
	First group to cultivate land in the riverside	Communal toilet in the riverside	Waste management in clusters E and C		
Manygro					
	They own a series of allotments along Juja Rd	They operate a communal toilet in cluster C	Waste management concentrated mainly in cluster A	Animal keeping, including hens and rabbits	HIV/AIDS and drugs awareness and sport events
Twaweza					
	Allotment adjacent to Bio gas toilet	Built and manage the Bio gas community toilet and kitchen	Waste management concentrated in cluster D / F	Starting to produce alternative fuels for cooking	Built retention wall in partnership with Mabatini YG
Mabatini		N/A	N/A		
	Agriculture in unused structures and plots			Animal keeping, including hens and rabbits	Built retention wall in partnership with Twaweza YG
Unnamed		N/A	N/A	N/A	N/A
	Allotments in unused structure (new YG)				
All YG	N/A	N/A		N/A	N/A
			Monthly cleaning event (Dec 2011)		

At the same time, the most established youth groups have started to collaborate with NGOs and even international donor organisations. The outcomes include the biggest community toilet in Mashimoni and the construction of a communal kitchen and allotment for one of the local schools in the area.

Some of the groups have also started to diversify their activities, on the one hand, to secure different sources of income and have safety nets for the financial health of the organisations, and on the other hand, to appeal to different potential youth members that may not be interested in urban agriculture or waste collection. These additional income generating activities include poultry keeping and sports events.

The following section will analyse the data collected during the observation and interviews with Youth Groups to subsequently apply the assemblage and diagrammatical approach and elicit information of the tactics in reference to the scarcity they try to address.

4.5.1 PRIMARY AND SECONDARY OBJECTIVES

- **Income-generation:** the main objective for mobilising as a youth group is to provide young people with alternatives for income generation and for them to invest their time in productive activities.
- **Waste collection:** youth leaders expressed that waste collection provided an opportunity to quickly organise and undertake a task with benefits that could be seen and experienced immediately by the entire village (cleaner corridors, less clogging of drainage and less burden of house chores for families).
- **Provision of adequate toilets:** Managing of communal toilets has recently become a primary objective, particularly to address underserved areas and to provide more adequate facilities for women and children.
- **Food provision:** The managing of allotments is a widespread activity among youth groups and one of the most versatile in the sense that is undertaken in any kind of space, including vacant areas, unused structures and the riverside.

4.5.2 RESOURCES (ELEMENTS THAT CAN BE PEOPLE, OBJECTS OR ACTIVITIES)



- **Young people of Mashimoni:** Currently, the faster growing community-based organisations in Mashimoni are youth-based and are the most visibly active. The average age of the members is between 18 and 32 (based on interviews with several different groups). They expressed they find difficulty in finding jobs, there was the general sense that being 'idle' is the worst thing to happen to young people, and that it is usually easy to recruit new members, although the consistency in attendance and active involvement seemed to be on a par with the capacity to financially profit from the activities. In terms of gender, youth groups are open to both men and women. Women are more often involved in activities like HIV prevention and urban agriculture, while garbage collection and sanitation was predominantly run by male youth members.

- **Local civil society organisations:** Other civil society organisations have a close relationship with youth groups, their inception and the way they work together. For example, Solidarité⁸ played a key role providing training and in some cases assisting with agriculture resources like seeds and fertilisers, particularly during the aftermath of the post-election violence. Umami trust is another key actor, working in partnership with the Twaweza Youth Group in the establishment of the Twaweza Community Bio-gas toilet.



- **Waste as a resource for income:** This includes the opportunity it gives to provide a service, but it also includes the use of some of the waste for recycling purposes.
- **Sacks, seeds and fertilisers as tools for operation:** These elements are usually bought with the profits of their activities.

⁸ Solidarité is a french humanitarian aid organisation focused on emergency response, food security and livelihoods, and access to drinking water and sanitation. It has been active in Mashimoni since 2008 after the post-election violence in 2007-08.

- **Vacant or under-utilised areas:** During the fieldwork it was possible to observe the temporary use of vacant spaces for agriculture activities. Youth groups take advantage of these areas and describe themselves as 'opportunistic', as they have to appropriate them as soon as they become available. In some cases, depending on the location, this appropriation may generate conflict with other residents, groups or including the Area chief, and lead to eviction. Nonetheless, despite this temporary nature, the appropriation of these areas helps them to attract attention as well as new members. In the case of new groups, it also helps them to achieve legitimacy and leverage to secure official registration later on.
- **Financial resources:** Financial resources are obtained through profits from the activities and if officially registered, through small funds available through the Secretary of Youth Affairs or international NGOs. However, there is currently no savings scheme in place in any of the youth groups interviewed.
- **Toilet infrastructure:** Only two youth groups currently manage toilet facilities, a single unit managed by Manygro and a large communal toilet built by Twaweza Youth group in partnership with an NGO and analysed in the transcalar diagram.
- **Animal shacks and animal stock**



Activities

- **Monthly cleaning events:** Every month, youth groups working within the Mathare Valley area, come together to organise a cleaning event engaging all the villages within Mathare Valley. For this purpose, they collect money from all youth group members to fund the activity, including buying cleaning tools and plastic bags. However, the majority of this money goes to pay the collection truck from the Nairobi City Council or in some cases from private providers. The collection trucks usually arrive the day after the event and they charge approximately Ksh 3,000 per collection.
- **Weekly waste collection:** The process is fairly simple. Members distribute weekly paper bags to the residents that have paid for the service, then they come back and collect the garbage placed outside the house on Sundays and they distribute the new bin bags all over again. Payment can be done

weekly or Monthly, depending on the capacity of the household. For a small additional amount, they also provide the service of clearing waste from corridors and open drainages.

4.5.3 SITES OF INTERVENTION

As discussed previously, youth groups are highly active within Mashimoni and have managed to devise several interventions with impacts in the following sites: **Toilets, corridors, main roads.**

- **Toilets:** Through the building and management of two community toilet facilities in the area.
- **Corridors, riverside and open spaces:** Through waste management initiatives including door-to-door waste collection and a monthly cleaning event.

The following section will juxtapose the data explained above into the assemblage diagram of the two scarcities that the youth group address in the built environment of Mashimoni: **Inadequate waste management** and **lack of adequate toilet facilities** (See Fig. 4.37 and Fig. 4.38).

Fig. 4.37 **Youth groups and their interventions in the built environment** | Interventions juxtaposed with the constructed scarcity "Lack of adequate waste management"

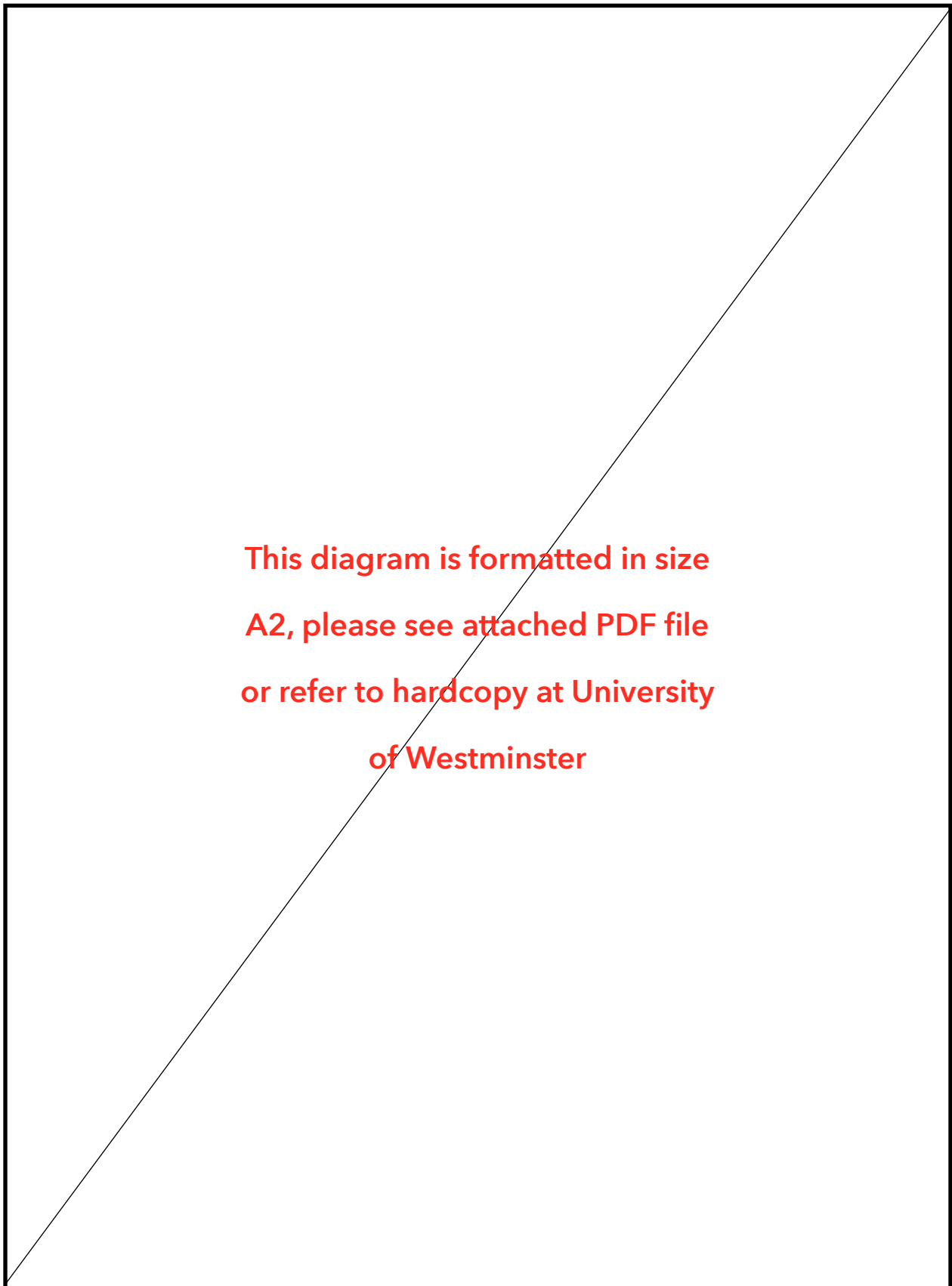
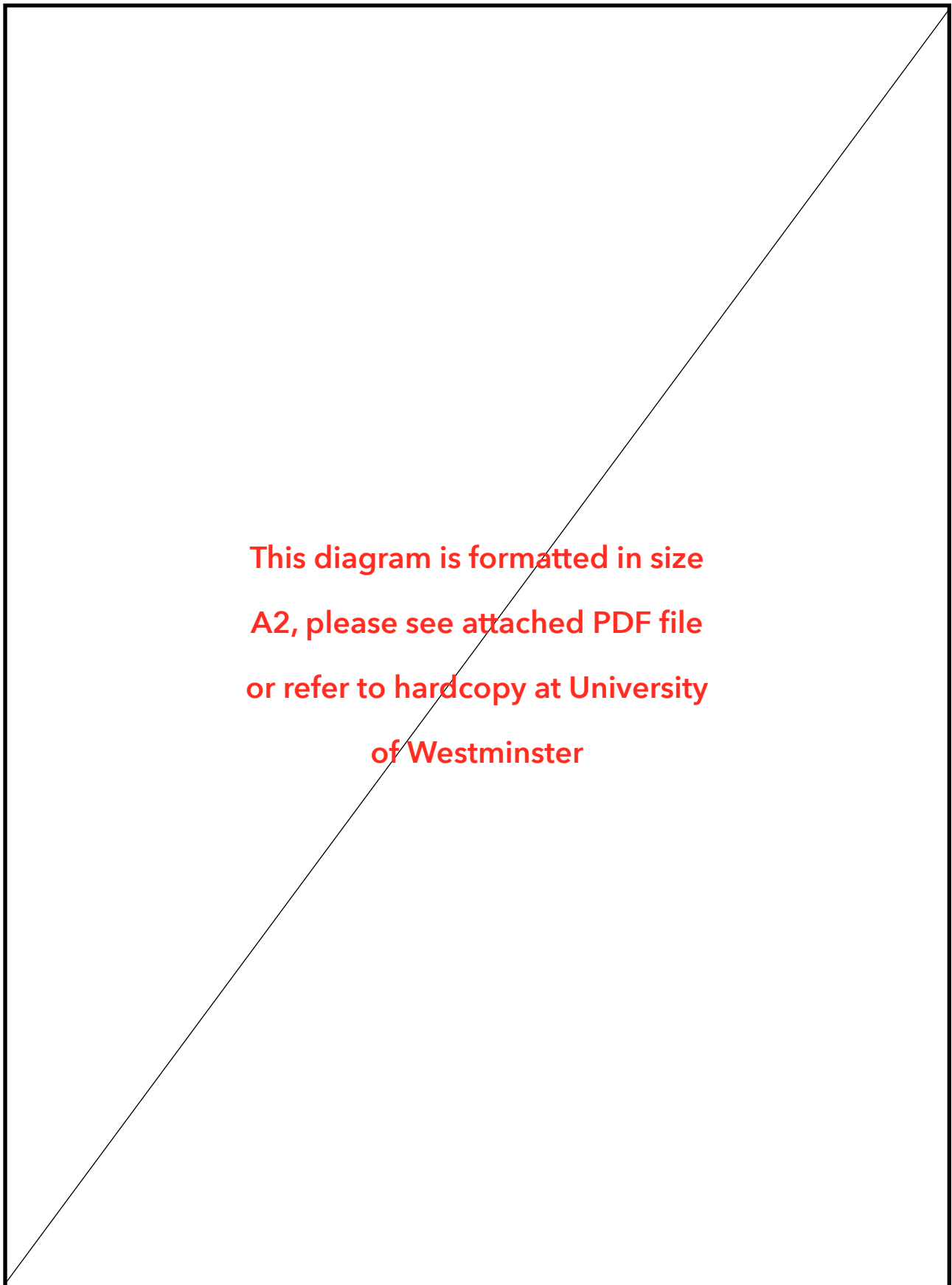


Fig. 4.38 **Youth groups and their interventions in the built environment** | Interventions juxtaposed with the constructed scarcity "Lack of adequate toilet facilities"



4.5.4 TRANSLOCAL AND TRANSCALAR ANALYSIS OF THE TACTICS: TRANSFORMATIVE, REACTIVE OR REVOLVING TRIGGERS?

The diagram (See Fig. 4.37) juxtaposes the tactics revolving waste management, from which the following findings emerged:

The monthly cleaning event as a transformative tactic: The monthly cleaning event is the intervention with the most potential to address the key condition experienced by residents (See condition A: Continuous emergence of temporary dumpsites). It does so through the introduction of a collaborative event, whereas a relation that was represented as purely material in the scarcity assemblage (inability to afford waste collection), is addressed through collaborative action and mobilisation at the settlement level. Through this event, using the financial and labour efforts from youth groups across all the villages, there is temporary alleviation of two issues within the scarcity diagram: the lack of access to an affordable waste collection service, and the temporary alleviation of spaces riddled by waste, including corridors and open spaces. The diagram shows how they use existing and new resources to address the issue, including the mobilisation at a settlement scale to provide labour (see social and contextual relation) and the input of new resources (material) through combining financial means at the level of Mathare.

Furthermore, by tracing the linkages of this specific condition and the intervention juxtaposed on top of it, it is possible to illustrate the potential of such intervention in other linked issues across the diagram, particularly on the lack of provision of formal waste collection services. It also points out that this intervention, mainly led by residents (the youth groups) and encompassing a large scale like the settlement of Mathare, provides an opportunity (see purple ring) for a positive collaboration with existing NGOs and CBOs already providing services for other informal settlements and tapping into existing funding or programmes that try to address waste management in this level.

The diagram also shows the potential of this intervention in reaching and affecting the experience of this scarcity according to the resident's daily life narratives, particularly through the temporary alleviation of spaces riddled by waste, as explained above.

Revolving Triggers: Nonetheless, the juxtaposition also illustrated other areas where the intervention by YG creates a revolver trigger. This is the case of weekly waste collection organised by youth,

where often the waste collected is thrown into the trenches located at Juja Road, or in some cases, in the riverside. The fact that the trenches are connected with the main sewage line entering and crossing Mashimoni, means that a great part of the waste collected makes its way into the village again, affecting corridors and the connected spaces. This means that the village remains riddled by waste most of the time, and the only partial alleviation comes with the monthly cleaning events. Youth groups did expressed their frustration at not having alternatives for dumpsites away from the village or more adequate disposal methods and found difficult to find other options.

The second diagram (See Fig.4.38) juxtaposes the tactics regarding provision of **adequate toilet facilities**, from which the following findings emerged:

The Twaweza biogas toilet as a transformative intervention. This intervention was devised by Twaweza youth group in partnership with an NGO and with funding from an international organisation. Nonetheless, this collaboration was only possible due to the strong leadership of the youth group and its proven record of mobilisation and collective activities.

The main benefits of this intervention addressed key aspects of the experienced scarcity, particularly the two main conditions it creates: Condition A, Poor maintenance and management of toilets facilities, and Condition B, poor design and construction of toilet facilities. The fact that the intervention was led by a youth group operating in the same area it was benefiting, led to good results in terms of immediate needs, like the provision of facilities that were adequate for women and children, as well as good hygienic features in place. Moreover, residents using the facilities commented on its good management, particularly because young people known in the area were responsible for them.

Moreover, although the inclusion of a biogas component in the facilities was an initiative from the NGO, the youth group also sought to maximise the physical structure built, by adding another story where sports activities could take place and more over, where profit could be made through rental services, hence used for educational and financial purposes. Currently the space is often rented by churches to office religious services and hold meetings which provides a constant flow of financial resources. This extra income has served to reinforce the group and diversify its activities, while also ensuring that the toilet has constant and reliable management staff in charge.

The potentials identified in the diagram: Based on the success of the intervention, and according to the linkages traced in the diagram, there is the potential to influence a framework for co-production of sanitation facilities that channels both government and international funding towards interventions that are rooted in existing successful organised groups.

Revolving trigger: Despite the relative success of this intervention, in terms of design and management, there are a few aspects that maintain the current conditions of scarcity explained in the previous section. Firstly, there is a personal relation that is not addressed through the intervention, which is the lack of education and awareness of how to use the facilities. This has led to misuse and in some cases, vandalising of the toilets, affecting their adequate management.

Secondly, key contextual aspects are not addressed, specifically the lack of adequate physical access to toilets. The toilet is located in a steep area of cluster F which makes it difficult to access, furthermore, it is isolated from some of the most underserved clusters, particularly B and E, hence losing an opportunity to positively affect the most deprived areas. This situation creates a revolving trigger because these underserved clusters will keep using the same toilets that already exceed their capacity.

4.5.5 TRANSLOCAL AND TRANSCALAR ANALYSIS OF THE TACTICS: KEY BARRIERS

The diagram also shows key barriers that impede the scaling up or greater benefit from the intervention led by youth groups on waste management, particularly the weekly events. These barriers include the extreme financial limitations of 67% of families that cannot afford the service offered by Youth Groups in Mashimoni. These families resort to dispose of waste in adjacent corridors or open spaces, exacerbating the problem.

Furthermore, as exemplified in previous discussions on scarcity in Mashimoni, the allocation of any land that becomes available in Mashimoni, is usually focused on rental housing, that imminently ends up benefiting only to structure owners. Till this day there is no record of allocation of land for disposal, recycling, compost or adequate treatment of waste.

Furthermore, these barriers are mostly of **material** and **political** nature, including economic aspects of Mashimoni households, enforcement of policies and regulations, and the control of land, which

focuses on profit-driven building of rental units, instead of community infrastructure and services for the greater benefit of the village. Another barrier that emerged was **contextual**, related to the revolving trigger discussed previously. This barrier relates to the existence of main sewage line coming from Air force and constantly bringing solid waste into the internal corridors and connected spaces within Mashimoni. As long as the condition of this sewage line remains the same, nothing will impede the constant flow of waste into the village.

Finally, the fact that land tenure is so far not negotiable with the Ministry of Defence, means Mashimoni has no access to national level programmes on infrastructure upgrading.

4.5.6 INITIAL LESSONS FOR THE BUILT ENVIRONMENT: WHAT WORKED, WHAT DIDN'T, HOW IT CAN BE IMPROVED AND/OR SCALED-UP?

Youth Groups interventions show the greater benefit of mobilising efforts beyond the scale of the village, finding a common ground and goal to address issues at a larger scale. It shows how in contrast, the weekly collection of waste, with no means to dispose adequately of the waste, has a revolving trigger effect that only marginally alleviates the scarcity, leading only to maintaining the status quo, without improving or worsening the situation. On the other hand, the large scale cleaning event, allows them to clear the waste for a couple of weeks, alleviating the clogging of open drainage, the strain in corridors and open spaces. Moreover, by being a highly public and recurrent event, marking every part of the village, it raises awareness among the residents.

In terms of the use of resources in this particular intervention, it shows how they use new material resources, but also existing social and contextual resources. This implies perhaps, the nature of looking for alternatives that are social and contextual, and how this may not imply the adding of new resources or expenditures. While focusing only on material usually means the new input and adding of financial costs.

In terms of barriers for this particular scarcity, the diagram shows how the key barriers are spread out across different scales. In contrast to the common discourse among authorities and experts interviewed during the fieldwork, the lack of tenure is not the only and absolute barrier that impedes any improvement in Mashimoni. The fact that barriers exist at different levels, far from being a

limitation, can be used as opportunities to slowly remove those barriers first and start alleviating different aspects of the constructed scarcity. Eventually, these strategic interventions at different scales can exert pressure for tenure procurement and acquisition.

4.6 INDIVIDUAL STORIES OF CREATIVITY AND ENTREPRENEURSHIP: NDASHA



Ndasha is a young man, born and residing in Mashimoni his whole life. I ran into him several times during the first month of the fieldwork, but it wasn't until later that I found out that he is the pioneer of many collective initiatives within the village, particularly among the youth. It was through the photo-voice exercises, that 4 residents interviewees mentioned him as the person to go to when something needed to be fixed or built. He is regarded among the village as a skilful, helpful person and an entrepreneur. Through a series of interviews, visits to his house and transect walks within the village, I mapped the interventions he undertakes for the improvement of his own house, his corridor, his neighbours' houses and services within the settlement.

"I started doing all kinds of jobs since I was a child. In primary school, my classmates used to wonder where I would get my money from! But I like to observe, my eyes are my teachers. I have learned how to build and how to make electrical repairs all by myself."

Ndasha is the founder of the Twaweza Youth Group discussed in Ch. IV, section 4.5. It was the first collective activity managed by young people and geared towards improving the waste management within the village while providing some income to its members. He initially coordinated the waste collection activities and managed the finances of the group. However, after some time, although he is still a member, he has decided to work by himself. The youth group continues to consult him when needed and he has also trained other emerging youth groups, including Bayroot. He has encouraged them to work territorially, in order to manage smaller areas but improve the efficiency.

At the moment, his initiatives are focused on the improvement of his own house, on providing services as a builder for structure owners, on offering repair services for tenants and on poultry keeping. He particularly assists with repairs for women that live alone with children, or whose partners spend long periods of time away from home. His own wife, Caroline, just arrived from Langata one year ago, on the north side of Nairobi. She has no connections to Mashimoni, no friends or family, and he considers this to be common and a precarious situation among women that move into the village after marriage.

The following sections will discuss and analyse his tactics, and their effects on different scarcity assemblages outlined in previous sections.

4.6.1 INTERVENTIONS FOR ADEQUATE HOUSING

One of the key interventions of Ndasha in the built environment of Mashimoni, is the building and repairing of housing structures in the area. His main objectives, apart from earning a living are:

- **Embellishment:** To make your house should look 'smart' for yourself and for visitors.
- **Comfort:** To prevent cold and warm temperatures inside the house, prevent rust from iron sheets and dust from walls.
- **Financial security:** To have a steady income through different sources

- **For personal development:** To avoid being idle and feeling useless, with nothing to do or contribute to his family and the neighbourhood. To encourage youth not to be idle as well.
- **To assist others:** Relief for residents that don't have the time and/or skills to do it themselves

He makes use of several resources, including his own skills and knowledge that he has diversified over the years, including fixing rooftops, wall construction, electrician tasks and recycling. He has also cultivated a reputation of being skilful among tenants and structure owners, and he has secured protection around Mathare which makes it easier for him to access 'wasted' materials.

He explained that part of his success lies on working independently and not in an organised group like he used to do in the beginning. He expressed that by working alone he saves time, avoids conflict and earns more money. However, he makes sure to advise other young people and youth groups. He also sub contracts some of the tasks to existing enterprises and respects other group's territories when it comes to garbage collection.

His clients vary from tenants and structure owners to churches and schools. He manages to subsidise those in worst financial conditions, in case they cannot pay. He feels he has a sense of attachment to the neighbourhood and a sense of 'duty'.

4.6.2 INTERVENTIONS FOR ADEQUATE TOILET FACILITIES FOR HIS WIFE AND NEIGHBOURS

The second intervention discussed in this section, implemented by Ndasha is the construction and management of a small shower facility in his corridor. His main objectives were:

- **Safety for his family:** To provide his wife with a safer option for bathing, especially at night.
- **For the efficient use of vacant spots in his corridor:** To prevent the inappropriate use of vacant spaces (for littering or open defecation).

Ndasha spotted a space that had recently become vacant in his corridor. He anticipated, as seen in other plots in the neighbourhood, that it would quickly become littered with waste and open defecation. He knew his wife and his neighbours had to walk long distances to the nearest communal shower, or sometimes had to shower at night in the corridors. He saw this vacant space as an opportunity and decided, not only to use it to his advantage, but to organise his neighbours and occupy it to build a communal shower right in their own corridor.

The neighbours contributed a symbolical amount for materials and Ndasha cleared the space and built a small facility. His wife and neighbours helps maintain the facility, and all the neighbours contribute to ensure nobody damages it or tries to clear the space. When asked if he had secured permission from the area chief, Ndasha expressed that he would had never gotten it, but that people have no choice but to make the best of what is available, especially if land is not being used efficiently. He expressed that the neighbours of the corridor are organised and would resist any 'eviction' of the communal shower, on the grounds that their cluster is neglected and does not count with a nearby suitable facility.

4.6.3 SITES OF INTERVENTION

Ndasha's interventions have had a direct impact on housing and corridor improvement across Mashimoni, as he is the best known builder in the area. He not only builds for structure owners, but also for tenants that don't have the skills, the support from family members or the resources to do it themselves. His interventions have also impacted on the lack of adequate facilities, by addressing a small part of the issue, with an intervention that involved the scale of the corridor. the following diagrams (Fig. 4.40 and Fig. 4.41)

Fig. 4.40 **Ndasha' interventions in the built environment** | Interventions juxtaposed with the constructed scarcity "Lack of adequate and flexible housing"

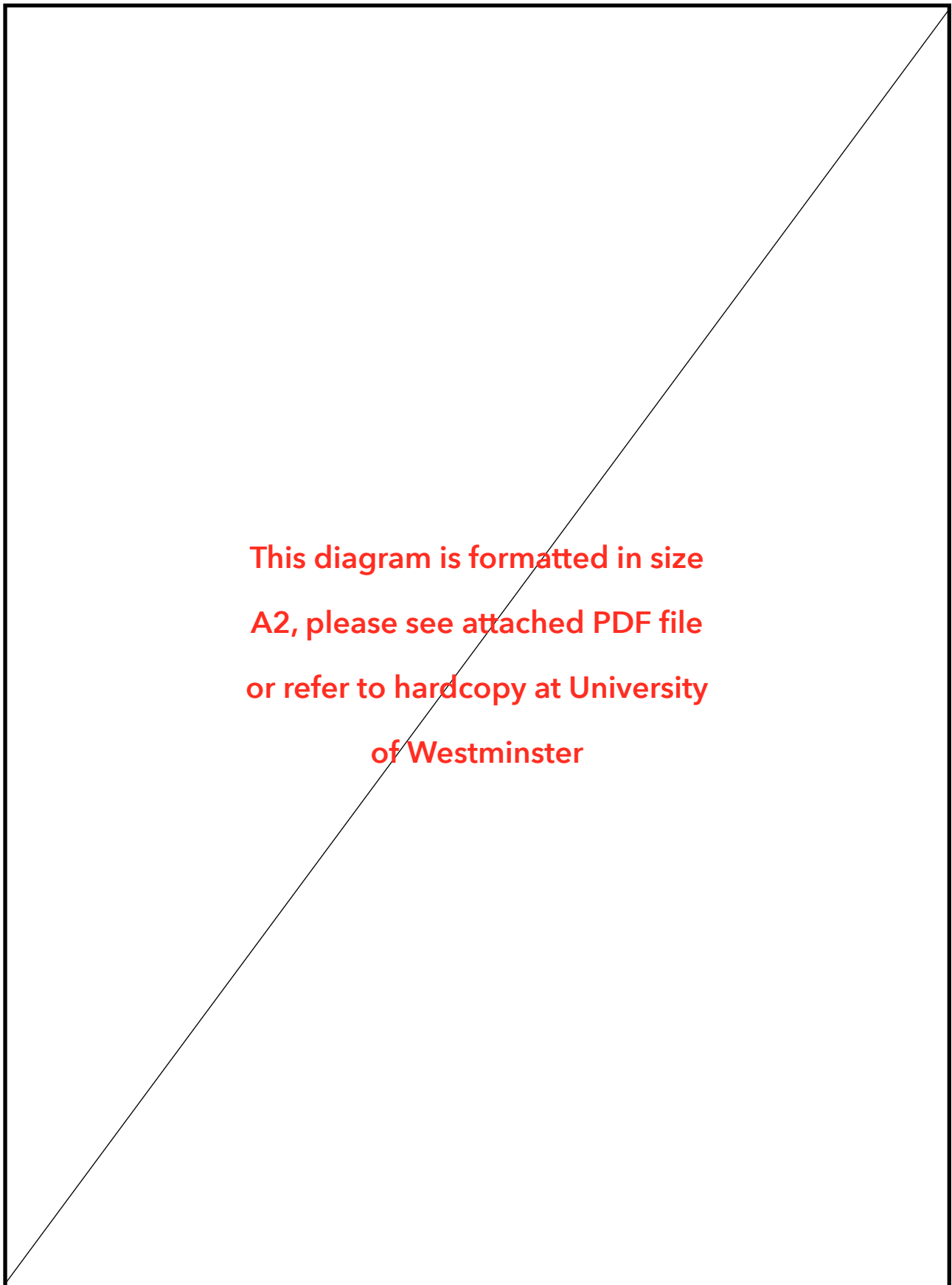
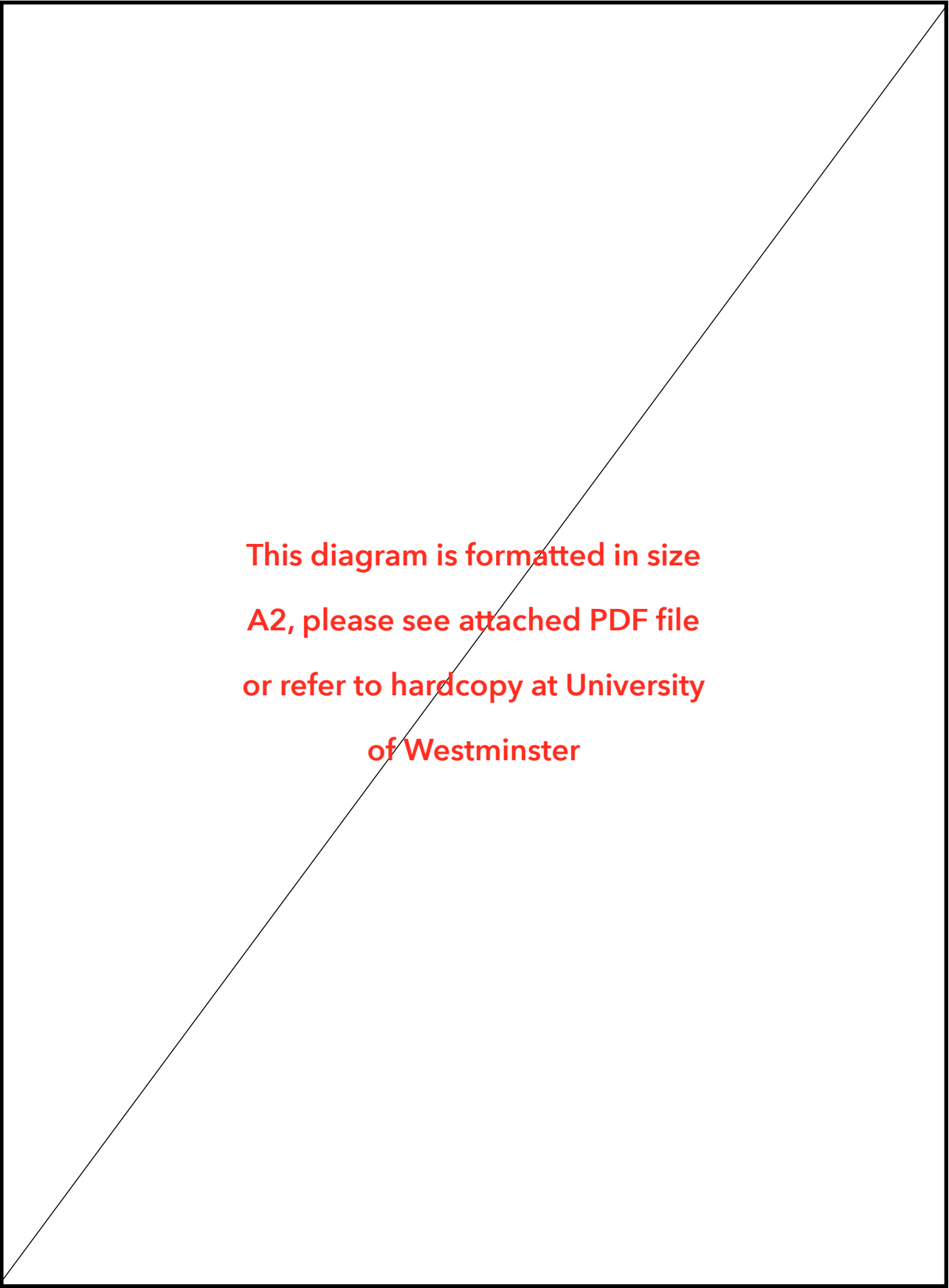


Fig. 4.41 **Ndasha' interventions in the built environment** | Interventions juxtaposed with the constructed scarcity "Lack of adequate toilet facilities"



4.6.4 NDASHA'S INTERVENTIONS ON HOUSING: TRANSLOCAL AND TRANSCALAR ANALYSIS OF THE TACTICS AS TRANSFORMATIVE, REACTIVE OR REVOLVING TRIGGERS

The diagram (See Fig. 4.40) juxtaposes Ndasha's tactics revolving housing, from which the following findings emerged:

Ndasha is the only agent identified during the fieldwork that addressed vulnerable groups within the village. In this sense, he offers affordable services to improve housing, mainly to women or residents that don't have the skills or the time to do it themselves. He doesn't charge for materials, as he gets most of them for free from the riverside or the surroundings. He does so by relying on established networks and providing services to different types of groups within the village, including structure owners, youth groups, business people around Mathare including scrap dealers.

The importance of networks and liaising with different organised groups which allows him to charge less for his services for specific groups.

The opportunistic approach and diversification of his skills. He manages to always have work because he has diversified his skills to serve different jobs and people, as well as creating supply chains for each of his jobs. For example, for waste management, he has created a network that includes scrap dealers along Juja road that buy his recycled material. On the other hand, for his building services, he has network of structure owners, as well as tenants that hire him across Mathare for building or repairing jobs. He has also secured networks for acquiring (in some cases for free) and transporting building materials. All of these networks ensure the sustainability and expansion of his services.

4.6.5 TRANSLOCAL AND TRANSCALAR ANALYSIS OF THE TACTICS: KEY BARRIERS

Even though Ndasha provides opportunities for improving housing, especially for vulnerable groups, there still exist the material, contextual and political aspects that impede any major transformation of the housing structure. The alleviation Ndasha provides is more in terms of financial means and skills, nonetheless, the intervention does not include a political aspect of subversion or pressure (see in contrast the intervention below).

4.6.6 NDASHA'S INTERVENTIONS ON TOILETS: TRANSLOCAL AND TRANSCALAR ANALYSIS OF THE TACTICS AS TRANSFORMATIVE, REACTIVE OR REVOLVING TRIGGERS

The diagram (See Fig. 4.41) juxtaposes Ndasha's tactics revolving toilet facilities, from which the following findings emerged:

Ndasha's intervention had a direct effect on the lack of privacy and dignity of his wife and the residents living in his corridor. He dealt with the rigidity of the space inside his house, by appropriating a vacant spot in his corridor and transforming it into a private bathing space. His intentions not only were related to the needs of his wife, but also to the fact that vacant spots become rapidly appropriated as dumpsites or for open defecation, hence he acted also with the purpose to avoid such appropriation in his corridor. When asked about the potential fine by the area chief for appropriating the vacant spot, he refer to two things: first, the lack of action of the area chief to provide for the residents and this being his only alternative, especially as cluster D is one of the most underserved in terms of toilets facilities. And secondly, that he relies on the support of his neighbours, by providing them with an alternative as well. So far, these two aspects have impeded the eviction of the shower from the spot.

The benefits from this intervention are experienced at both the housing and corridor level, which facilitates its better management as well as support against potential eviction or claims over the land. Although there are no guarantees the shower cannot be dismantled if the area chief decides to or of someone else with more power claims rights to the vacant spot, there is also the potential for using a collective approach to appropriation as a means to exert influence in decision making over land allocation and provision of communal services and facilities. The diagram illustrates this as a potential, as well as possibility to use as example for future co-production between external actors and residents.

4.6.7 TRANSLOCAL AND TRANSCALAR ANALYSIS OF THE TACTICS: KEY BARRIERS

The barriers in this case pertain to contextual and temporal aspects related to the corridors and the lack of street lights. This means that even if the shower is located in proximity to the residents, there are still associated risks with using it during the night. Some residents, particularly men, come back at night and find it useful to shower at this time. This also means, women continue to be the most affected, as they face barriers using communal facilities at night, even if these are located nearby.

4.7 LARGE-SCALE SAVINGS GROUPS AND THEIR IMPACT ON THE BUILT ENVIRONMENT

Muungano wa Wanavijiji Mashimoni is the biggest and most influential community-based organisation in the village. It is part of an homonymous umbrella organisation representing over 300 informal settlement across cities and towns in Kenya. The origin of the organisation goes back to the problematic 1990s, where violent confrontations and evictions led to the emergence of several small organised groups in Nairobi protesting against government hostility and land grabbing.

Since their inception, village-based Muungano groups started networking and cooperating with other similar groups and civil society organisations to advocate for provision of services and land rights, while also maintaining a village-specific focus in their objectives.

In the case of Mashimoni, one of the villages with the most obstacles to overcome land tenure, a considerable part of the efforts of the organisation is geared towards advocating for a positive resolution that grants them some sort of tenure security. They also invest in built environment projects, mainly through collaboration with NGOs like Pamoja Trust and MUST (Butcher and Frediani, 2014).

The savings scheme is the most formalised and complex initiative they have and is the one that they champion the most, also to get more members joining.

Saving schemes was a concept introduced by Pamoja Trust to Muungano, as a tool to encourage ownership of built environment projects and to convince the government that slum-dwellers have the capacity to be partners, financially and logistically, in the slum upgrading process. At the moment, Muungano has successfully established 137 savings schemes in nine cities across Kenya and has a membership of over 60,000 active members nationwide (MUST et al., 2012).

4.7.1 PRIMARY AND SECONDARY OBJECTIVES

- **Community governance structure for negotiation and advocacy** The main objective for Muungano has been the mobilisation of residents for negotiation and advocacy, particularly to secure land tenure and the provision of basic services. They have also set up a very complex saving scheme to secure enough funds to self-build some aspects of the upgrading process. A small part of this

savings is also used as safety nets, meaning small loans available to members for emergencies, like death, health bills and so on. At the moment, about 400 households contribute to this saving scheme, while the rest of the residents remain wary about investing without securing first the land tenure.

- **Savings scheme for improving livelihoods** More recently, Muungano has changed its approach with regards to membership and saving schemes. They have now encouraged savings schemes to invest in business endeavours and livelihoods. Residents do not have to be Muungano members in order to be part of the saving scheme. Furthermore, it is decentralised, as it is managed according to clusters, therefore each saving scheme meets and manages its savings according to their rules. This approach has started to generate more trust in Muungano, as well as encouraged a culture of saving and investment among the population.

4.7.2 RESOURCES (ELEMENTS THAT CAN BE PEOPLE, OBJECTS OR ACTIVITIES)



Technically, Muungano savings groups are open to all residents of Mashimoni. At the moment, the membership reaches over 400 members out of more than 1,000 households, with various levels of active engagement. However, there is clear distinction between those who own structures and those who are tenants.



Attendance and savings cards. Members have to be able to record their participation and the correct management of their own savings. Muungano has also invested in building capacity among residents with regards to numeric literacy.

Venues (the office, open meetings) Muungano has secured a small structure for meeting in a central location within Mashimoni. However, due to its size, it is only used for board meetings and workshops, while the rest of the meetings are held according to clusters or in public spaces to attract the attention of other residents. When the main office is not being used, the group rents it to

churches or other groups to hold meetings or festivities. In this way they can finance some of their management costs.



Activities

Weekly meetings. For Muungano, communication and information are key to mobilise residents. They hold meetings every single day for different purposes, board meetings, cluster meetings, women meetings and so on. The main leaders have also to invest considerable amount of time procuring and holding meetings with authorities.

Recruitment. A lot of the group's time is also invested in recruitment campaigns, like public speeches and street theatre.

4.7.3 TRANSLOCAL AND TRANSCALAR ANALYSIS OF THE TACTICS AS TRANSFORMATIVE, REACTIVE OR REVOLVING TRIGGERS

Despite Muungano being the biggest community based organisation in Mashimoni, the impact of its interventions could not be illustrated as considerable in the experienced scarcity of residents. This is not to underestimate the importance of such a highly organised group with important established networks and partnerships, but it offers important lessons on the need to find a balance between immediate needs (for example the narratives that emerged from experienced scarcity) with the structural barriers they try to address (higher levels of the constructed scarcity) and overcome and towards which, most of their efforts are focused. This is evident in the fact that from all the the four main scarcities and associated conditions that emerged from the fieldwork, Muungano only manages to have a role in one, which is housing. Nonetheless, it is the only group trying to address the lack of representation and information pertaining the village, including the organisation of a participatory enumeration with potentially great repercussions for the the future of the settlement.

Perhaps, this shows that when issues are articulated as mainly political, and delegating immediate effects like more material and contextual aspects, it divides opinion and limits the capacity of the intervention to mobilise and gain support among those that experience first hand the effects of the scarcity and that usually constitute the majority.

In the same way as Ndasha, but on a larger scale, Muungano offers the possibility to make savings and invest them in housing, providing an extra income for the purpose.

4.7.4 TRANSLOCAL AND TRANSCALAR ANALYSIS OF THE TACTICS: KEY BARRIERS

There are important barriers within the interventions and approach of Muungano, which are mainly political. As evidenced by the attendance at regular meetings, including both tenants and structure owners, there is a considerable power differences and competing interests between the two. These differences become a barrier as long as structure owners have the majority of influence in the area and no flexibility to include tenancy rights in their approach. So far, Muungano does not directly address the need for tenancy rights among their members that are structure owners, nor at the policy level or their negotiations with authorities. It was evident the delicate nature of this discussion within the organisation, as often, leaders need the support of structure owners for the land tenure agenda, but also need the support of tenants as they constitute the majority of the population in the village. This leads to a substantial barrier at the local level that needs to be addressed if the scarcity of housing is to be ameliorated.

At the same time, even though Muungano offers the opportunity to make savings and invest in housing, this investment is highly limited by the material, contextual and political barriers that impede major physical modifications of housing structures in the area, especially for tenants.

4.8 CONCLUSION: WHAT MASHIMONI REVEALED FROM THE RELATIONSHIP BETWEEN SCARCITY AND CREATIVITY IN THE BUILT ENVIRONMENT?

Mobilisation and networking according to common needs. Mobilisation at a larger scale, the fact that scarcity is widespread among the majority also becomes a resource to mobilise and create greater and more beneficial effects.

Diversification and stability from contingency. The fact that contingency is rife, changes are fast and new needs are always emerging, eventually push towards a safety net approach, whereas a variety of skills and ways of acting are needed to provide a better and more constant and stable quality of life and income.

The need to go beyond the tactic and be more strategic. For example, Ndasha knew that he couldn't appropriate that space just for himself and his wife, but by including the neighbours, he would ensure the space is adequately and better managed while also providing a service for more people and getting greater support against possible barriers like the area chief and his control over allocation of land.

The needs to link structural influenced goals with immediate needs with, especially in settlements where access to land tenure is complex and highly difficult to obtain. By looking at scarcity as constructed with a wide range of aspects in its construction, there might be a way to find a balance between small scale goals and larger schemes towards recognition and citizenship, as in the case of the discourse of Muungano. Moreover, this shows the importance of understanding **key contextual circumstances** as well as local levels of disadvantage and inequality at the very local level.

The need to take advantage of any physical structure or land available in the best way possible. As evidenced by the decision of the youth group to expand the toilet facility into a rental unit for communal services, as well as Ndasha's decision to appropriate the vacant space for a shower for his whole corridor. This mobilisation at the corridor level was able to influence or at least minimise the effects of the area chief and his control over vacant spots and allocation of land.

PART I | DECONSTRUCTING SOCIO-SPATIAL DYNAMICS OF SCARCITY IN THE BUILT ENVIRONMENT OF ATUCUCHO

5.1 CONSOLIDATION OF INFORMAL SETTLEMENTS IN QUITO

5.1.1 HOW AND WHY INFORMAL SETTLEMENTS EMERGED?

It is a well documented fact, that informal settlements are the main means by which urban dwellers can access affordable housing in many Latin American cities (Jaramillo, 2008). In the case of Quito, up until the 1960s, the city was comparably modest in size in comparison with urban growth in the other big capitals in South America. Nonetheless, after the immigration boom, especially from population from the sierra⁹ into the urban areas, the urbanisation process has been in constant acceleration to the point where by 2001, 61% of the population was living in urban areas¹⁰, predominantly Guayaquil and Quito.

During the last three decades, particularly during the 1990s, the city has expanded mainly towards the northern and southern limits of the city, largely influenced by the trend of emerging informal settlements in those two geographical points (Castello Starkoff and Cueva Ortíz, 2012). Between 1990 and 2000, more than 400,000 houses were built in irregularly acquired land, providing shelter for an average of 31,000 families per year (UN-Habitat, 2008). These areas are characterised by the presence of strong topographic elements like mountains, slopes and water streams, this is a reason why most of the settlements are located within green belts or ecologically protected areas, posing another layer of complexity to their existence and consolidation.

⁹ Sierra means the mountains parts of the country, surrounded by the mountain range and volcanoes and includes the area of Quito.

In the same line, the following types of informal settlements started to emerge:

Occupations - Posesión de Tierra

An illegal occupation of a unused piece of land, of either private or public ownership. Generally, the land is invaded collectively over one night and consolidated quickly over weeks and months, through the use of *mingas*¹¹. Occupations usually emerge at the periphery of the city, or in land that has been allocated for green areas or agricultural purposes. These include earlier occupations (1970s-1980s) and recent occupations (2000s). Earlier occupations are located mostly in the North-west part of Quito, in areas that were considered part of the green belt back in the 1980s. There are a few located in small pockets inside the city. Recent occupations have emerged mostly in the south of Quito, in areas zoned as industrial or agricultural, hence less densified.

Subdivisions - Fraccionamientos

Subdivision are a more recent phenomenon, emerging mainly after the government implemented stronger measures against occupations or invasions of land. The 'subdivisions' are a product of illegal traffic of land. A fake 'developer'¹² subdivides the land into plots and sells it to (unsuspecting) individual families or cooperatives. Usually the traffickers understand the circumstances of people without access to affordable housing and exploit situations of desperation and hopes for a house of their own. They are also proficient in persuasion and in hiding the irregular nature of their activities. Strategies include recruiting clients in popular congregations like public spaces, transport hubs, even through newspaper and television adds. Potential clients are given tours of the area and shown plans of the neighbourhood and the individual plots.

Rights and Stocks - Derechos y Acciones

This happens when there is an existing subdivided plot that doesn't adhere to zoning and regulations, hence the land is 'co-owned' by all the residents. It can be due to illegal occupation/ subdivision, inherited plots etc. (I have no data from this type of settlement as they are less common). They are located mostly in the south of Quito, in areas zoned as industrial or agricultural, hence less densified.

¹¹ Mingas are a pre-Columbian tradition commonly implemented in the Andean countries. It consists of collective efforts and voluntary work (i.e. labour, savings, contributions) for communal or reciprocal benefits.

¹² Many residents enter into what they believe to be a legitimate contract, often negotiated with a developer that claims to be in legal possession of the land.

In all these examples, the term 'informal' does not mean residents do not pay for the land they settled in. In each type of informal settlement, residents only take possession of a plot of land, after paying a fee and entering various degrees of contract with a 'developer', land trafficker or 'agitador'.

Table 5.1 Dwellers and their role in the inception and upgrading of earlier occupations (1970s-1980s)				
Action		Done by	In partnership w/	In a period of
occupation	taking possession of the land	all residents (led by an 'agitating agent')	n/a	over-night
	demarcating plots	all residents (led by an 'agitating agent')	n/a	over-night
	building houses	all residents (led by an 'agitating agent')	n/a	over-night
	formation of committees	initiated by the leader (through cooperatives, improvement committees etc)	n/a	immediately after the occupation (the foundations sometimes are established beforehand)
upgrading building works	houses	the individual (sometimes by commissioning others, often other neighbours), and sometimes aided by mingas	other residents	20 years +
	services / infrastructure	self-managed through committees, elected in general assemblies	i.e. with illegal providers, or simply taking from neighbouring legal settlements, and eventually with agreements with authorities	10-20 years
maintenance		all residents through mingas	sometimes NGOs, schools etc	constantly
agriculture /greening		mostly non-existent	n/a	n/a
land negotiations		leaders of the committee/ cooperative	only in the last decade, the municipality has provided legal assistance	20 years +

5.1.2 APPROACHES TO/AGAINST INFORMAL SETTLEMENTS

Although the 1990s marked the decade where the majority of massive invasions took place and consolidated, it was not until 2001 that the first government programme was devised to tackle land tenure and regularisation of these settlements, which is now known as '*Unidad Especial Regula tu Barrio*' (UERB) or Special Unit Regularise your Settlement. Statistics show that between 2001 and 2008 only 159 settlements were granted legal tenure, but after the transference to the Uerb, more than 50 settlements were regularised in one year, with a current yearly goal of 100 regularised settlements. This change, was not only a bureaucratic passage from one unit to another, but a change in the use of terminology and approach to what used to be largely regarded as illegal land and housing practices. The approach of the current 'Regula tu Barrio' is explained in detail below.

Regula tu Barrio

The main programme dealing with informal settlements is called "Regula tu Barrio" or "Regularise your Settlement". From its objectives and description, the word 'informal' is completely absent, alluding instead to the regularisation of practices that do not match with the current regulations and urban normative. The 'invasores' or invaders, are now described as legitimate possessors of the land. Moreover, it states the need to adapt regulations in the process, as well as to formulate new ones.

In this line, this programme is conceived basically as a 'co-production' of habitat, where the approach revolves around a set of technical, judicial and social processes. The municipality provides legal assistance to get the tenure of the land (which involves dealing with land traffickers, expropriation of public/private land), while, simultaneously, the barrios are required to self-manage the improvement of the settlement, including a 'Casa Barrial' or communal house, green areas, allotments, small infrastructure improvements (stairs, sidewalks, regeneration of riversides etc) and most importantly, they are required to have a solid track record of social organisation, including an active 'improvement committee' and savings groups (although not as elaborated as in Kenya). When the land is close to be acquired or cleared by the municipality, the barrios have to look for professional assistance (usually from architects) to come up with a plan for their settlement and the municipality and other organisations also provide technical assistance. This is a lengthy process, hence throughout those years the barrios have to work constantly towards their own upgrading.

5.2 AN INTRODUCTION TO ATUCUCHO AND ITS KEY MOMENTS OF SCARCITY

5.2.1 EMERGENCE AND CONSOLIDATION

Atucucho is an inner city site and is one of the first occupations in Quito, dating back to the 1980s. It is located in an abandoned farm, in land zoned as green belt and property of the Ministry of Health. The site is on a steep slope, at 3,100m high. Atucucho has 17,000 families divided into 6 sectors and each sector has its own improvement committee, governed by a general assembly. Other committees include: water, safety, and transport. It is very consolidated with self-building and self-management of the settlement.

Atucucho has a difficult history in terms of leadership, the occupation was massive in scale and organised by very strong and controversial leaders. The settlement remained without an improvement committee for 8 years. Hence the delay in the regularisation process. Since 2010 a new committee was formed and have managed to have a good relationship with the authorities. They have accomplished substantial improvement in the neighbourhood and are close to getting the titles of the land next year.

They are settled in a mountain, in the middle of the city (in the 1980s this was the periphery) hence initially it was a very precarious situation. Although the settlement is consolidated with communal areas, proper water and electricity connections, markets, a high street and paved roads, you still can observe areas that need improvement and safety is still an issue. Some sectors still have 'shacks' and are settled in risk-prone areas. Original plots were of 13m x 8m but currently some houses are very large, some with more than 3 stories. The history of the settlement is long, and well documented and is plagued with violent evictions and land disputes (in the 1990s).

5.2.2 A RETROSPECTIVE ACCOUNT OF SCARCITY: A LOOK OUTWARDS, LOCATION AND RELATION TO ITS SURROUNDINGS

Atucucho is located in the Northwest part of Quito, settled in between 3,100m and 3,200m above the sea, bordering the Pichincha volcano and part of one the largest green corridors surrounding the city. In a similar way to Mathare Valley, what started as a peri-urban settlement, geographically detached from the city, has now found itself bordering the Mariscal Sucre Avenue, one the main transport arteries that crosses Quito from North to South. Moreover, the expansion of the city and encroachment on its surrounding mountains, has put the settlement right at the centre of increasing economic growth and pressures from the land and property market. It is located in the parish of Concepción and was incorporated in the urban area of Quito in May, 1990 (Lunda and Ruíz, 1993)

Although settled in a relatively plain area, the settlement is surrounded by steep slopes in each of its borders, and some inhabited areas, particularly the ones that consolidated in recent years, are settled in highly inaccessible places. This difficult topography however, has played a key role in the emergence and consolidation of Atucucho, and also in its current challenges and opportunities. On the one hand, its difficult access facilitated the process of invasion, by complicating access by the authorities and giving enough time for settlers to build shacks and open rudimentary pathways. It also helped to minimise the danger of evictions, as it was physically impossible to bring heavy machinery for demolitions.

Its location within a green corridor, bordering the pichincha volcano, provided a wealth of natural resources that at the time of the invasion and initial consolidation, proved vital for the survival of the settlement. Residents made use of the eucalyptus trees for building the initial shacks or '*mediaguas*'¹³ and water streams ensured provision of water for almost 15 years.

Nonetheless, this same privilege of being almost unreachable, meant that the settlement would remain detached from the city, in terms of services and mobility for many years after the invasion. In contrast to the other type of informal settlements in Quito, established in the centre, Atucucho settlers had to devise lengthy and complicated social and physical mechanisms to acquire services and build their houses.

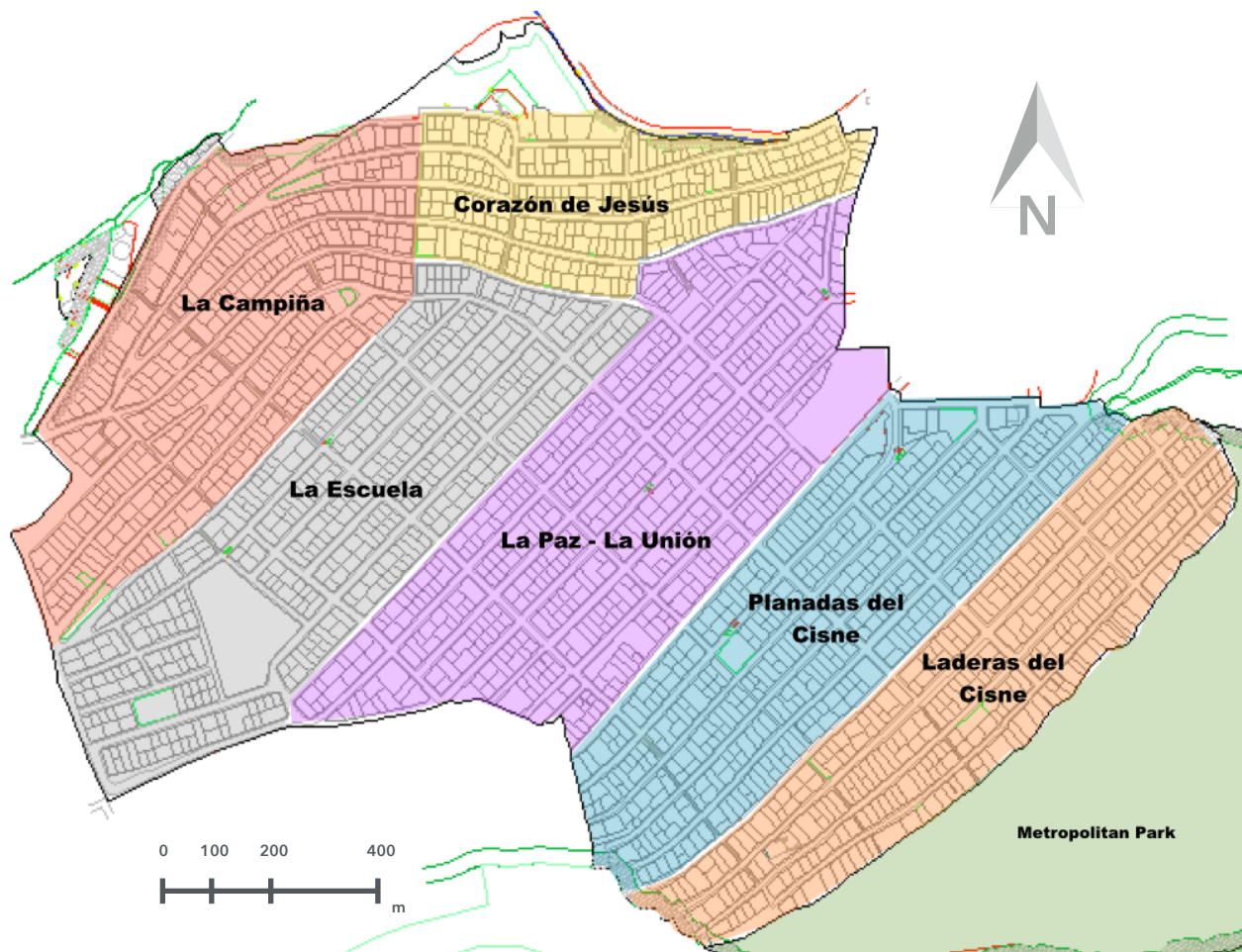
5.2.3 CURRENT SITUATION

Consolidation of the current layout was also shaped by the topographic and geographical features of the area. The settlement is divided into 6 sectors: La Escuela, La Paz-Unión, Planadas del Cisne, La Campiña, Corazón de Jesús and Laderas del Cisne (See figures 5.1 and 5.2). Of these, the former 3 are located in the plainer and more accessible area of the settlement, while the latter are settled in the steep slopes bordering the area and were inhabited slowly in the second decade of the consolidation process.

Recently, the forest located in the south-east border was designated as Metropolitan Park and will be managed by the settlement.

¹³ Mediagua is a common name given in Ecuador to housing structures of a temporary nature, built over-night, for emergencies purposes.

Fig.5.1 Plan view of the six sectors of Atucucho



Through the interviews and transect walks, it was discovered that there were marked differences between the sectors, particularly those located on the slopes of the mountain (see Fig. 5.3). The houses are more precarious, access remains difficult in some areas and some services (waste collection and transport) are of lesser quality in comparison to the other three sectors. These are the areas with more social conflict and lack of safety as well. Some of the plots were abandoned eventually by the original settlers as it was difficult to build in the slope. More recently, these abandoned plots were invaded by new inhabitants that lacked any connection with the rest of the settlement or its history of mingas, hence most of the time they do not participate in the improvement of the neighbourhood generating conflict with the rest of the population.

Fig.5.2 Overview of the six sectors of Atucucho



Fig.5.3 Plan view and images of the most vulnerable sectors of Atucucho



5.3 SOCIO-SPATIAL DYNAMICS OF SCARCITY IN ATUCUCHO

This section will use the scarcity diagrams to visualise and understand the construction of scarcity in the built environment of Atucucho, with regards to specific themes that emerged from the data analysis from the fieldwork. It will do so by zooming into the historical experience of residents in the settlement and what they articulate as the scarcity in the built environment.

5.3.1 LACK OF ADEQUATE HOUSING AND LAND



Fig. 5.4 Overview of *mediaguas* and housing at the different stages of consolidation.

The lack of affordable housing solutions for a large percentage of the population in Quito, is the main driver behind the emergence and consolidation of Atucucho. This scarcity was analysed from the retrospective and current narratives of selected residents from Atucucho, spanning across the six sectors (See Ch. III, Fig. 3.4).

All the residents were previously tenants, usually renting small units in the periphery or in dilapidated areas in the centre of the city. Most of them emigrated to Quito from rural areas, looking for better employment opportunities and living conditions. What they found was conditions of overcrowding, dilapidated units, disconnection from the city services and most of all, situations of abuse by landlords with high rents, threats of eviction and lack of maintenance to the units. This everyday situation, coupled with the fact they did not own their house and could not make any amendments to it, led residents to look for alternatives.

Once part of the invasion, their house became their personal everyday project. Work invested in it would include building it overnight (a *mediagua*), rebuilding after storms, strong winds or eviction attempts, maintaining it, improving it, adapting it, expanding it and when resources were enough, consolidating it from *mediagua* to a house.

According to an extensive diagnosis, and the current only written record of the conditions of Atucucho during the first years (See Lunda and Ruíz, 1991) 10 percent of the households were using the structures for economic activities. Original plots were of 104 square metres, although some families managed to acquire two adjacent plots, doubling the final size. The most common materials for the first four years included straw, reed, wood sticks, plastic and bricks, with 17 percent of houses lacking any windows. Half of the houses had zinc roofs and rammed earth floors with 17 percent lacking any windows (Lunda and Ruíz, 1993).

(a) How residents lived this scarcity everyday? Analysing the elements, sites and relations

Condition A: overcrowding & abusive conditions as tenants

Political

The first issues mentioned by residents when discussing abusive conditions suffered as tenants, were the fluctuating rents, the inability to acquire a legal contract that protected them from eviction, and the mistreatment and intimidation tactics from landlords.

Although these issues were seen at the beginning as a compromise for cheap rents and the ability to rent without providing formal job contracts or bank accounts, with the passage of time, residents found themselves with less negotiation space with the landlords. The constant threat of eviction and stress posed by instability and intimidation tactics, was mentioned as one of the drivers causing them to seek alternatives for housing, even if these seemed extreme and risky, such as being part of a large-scale invasion.



Material

The aspects most mentioned by residents when discussing their previous situation as tenants, was related to the insufficient internal space, lack of regular maintenance of the units and the strict restrictions from landlords on expansion, number of people within the house, and the social and/or productive activities permitted within the unit. Housing units were usually located in flat typologies or rooms within houses. This meant that internal space was limited and offered little room for expansion. Overcrowding was common, as well as lack of privacy and constant arguments with neighbours. Even under these conditions, adaptations undertaken by residents within the house were mostly avoided, either by lack of financial resources or by concerns over eviction. Landlords on the other hand, were reluctant to invest in adaptations or improvements themselves, either by lack of

will or conviction that such investment was not necessary, as rental units were always on high demand.

With regards to maintenance, many of the units were located either in already dilapidated buildings inside the city's historic centre, or in poorly constructed multi-story buildings in the periphery. Despite complaints or attempts to negotiate, residents were unable to secure better conditions within the units they were renting. Some of the issues mentioned regarding maintenance were high humidity, poor sanitation and lack of natural light and ventilation.

Other aspects mentioned by residents, were the restrictions imposed on the number of people that could live in the house and the type of activities they could undertake. Some residents experienced eviction after having more than two children. Others were abused if discovered undertaking business or manufacturing activities within the house, like sewing, tailoring or growing vegetables. In all cases, keeping animals was forbidden. These restrictions posed many limitations on families, that in most cases had to rely on casual labour, and were in need of safety nets that could provide them with additional income. Moreover, many of the families emigrated from rural areas, and the skills they initially could rely on to survive were related to agriculture and animal keeping.



Social

Restrictions on social and recreational activities were mostly imposed by landlords and the actual lack of space inside the house or the vicinity. Young families struggled to provide their children with minimal space for playing. Houses were normally overcrowded and in bad condition, while the neighbourhoods surrounding them, did not provide safe open spaces they could use. Families emigrated mostly from rural areas and had few social networks within the neighbourhood and city, hence the importance of being able to undertake social activities and interact with other people.

Condition B: Limitation of material and financial resources to access housing

Material

During the exploration of experienced scarcity, this specific condition was articulated initially as material, including: The lack of access to affordable credit loans and interests, the inability to access affordable and resistant building materials, and the lack of affordable labour and technical assistance.

The financial limitations encountered by residents of Atucucho, relates to two important moments: their arrival in the city and the inability to buy a house of their own, and their arrival in Atucucho and the financial constraints limiting their choice of whether to invest rapidly or gradually in the consolidation of their house. Once arriving in the city, the housing and land market were unaffordable for the low-income population, that were obligated to take shelter in inadequate housing units. Once established, their capacity to save was non-existent, particularly for the expenses incurred in rents.

Once established in Atucucho, residents freed themselves from monthly rent payments, allowing for an increase in their financial capital and capacity to save. Nonetheless, the illegal nature of their occupation of the land brought new limitations on access loans and affordable interest rates. During the first years of occupation, residents could not comply with basic requirements such as proof of address or certificates of legitimate possession of the land. This meant that the residents of Atucucho had no claim to any type of loan or even financial aid from the government. This is reflected in the fact that all interviewed residents remained living in a *mediagua* for at least **5 years** after the initial occupation.

When residents started inhabiting Atucucho, they encountered a highly difficult terrain and geographical conditions to build a house on. The requirement for labour and technical assistance took a more challenging and complex nature. To build a house of their own, it was necessary to clear access to the plot, clear the terrain and understand the soil, weather and geographical conditions they were exposed to. All interviewees arrived only with their families and their own skills, some obtained while working as construction labourers. With no financial assistance in the form of loans or savings, residents were unable to hire more experienced labour or technical assistance.

At the same, residents found themselves in an inhospitable terrain, with no access to cheap materials. Even if some residents could afford bricks or cement blocks, it was impossible to carry them into the occupation during the initial years as the only dirt road were built 4 years after the initial invasion. This situation meant that houses could only be built with the material available in the surroundings.

Condition C: Exposure to weather events and hazards



Material

Since the occupation, life in Atucucho has been characterised by exposure to hazards and weather events. Within the narratives of their experience of lack of adequate housing, residents mentioned the temporary nature of their structures as a key element that affected their quality of life. All residents lived at least 5 years in *mediaguas* made of cheap or recycled materials, like wood sticks, adobe bricks, corrugated sheet, carton and/or plastic. During this time, they were exposed to flooding, landslides, constant humidity and extreme heat and cold weather.



Political

Risks were also associated to the uncertainty of possession of the land and the competition for plots and vested interests within Atucucho. Conflicts, tensions and even violence was common during the first years, as neighbours and even outsiders competed for plots. The residents already established had to remain vigilant of their own plot in order to avoid intruders taking possession of them. One of the mechanisms issued by the leaders at that time, was to patrol the settlement everyday and undertake a 'roll call' to monitor if a plot was being actively occupied. If a plot was discovered to be left unused for several days, leaders could re-sell it to others.

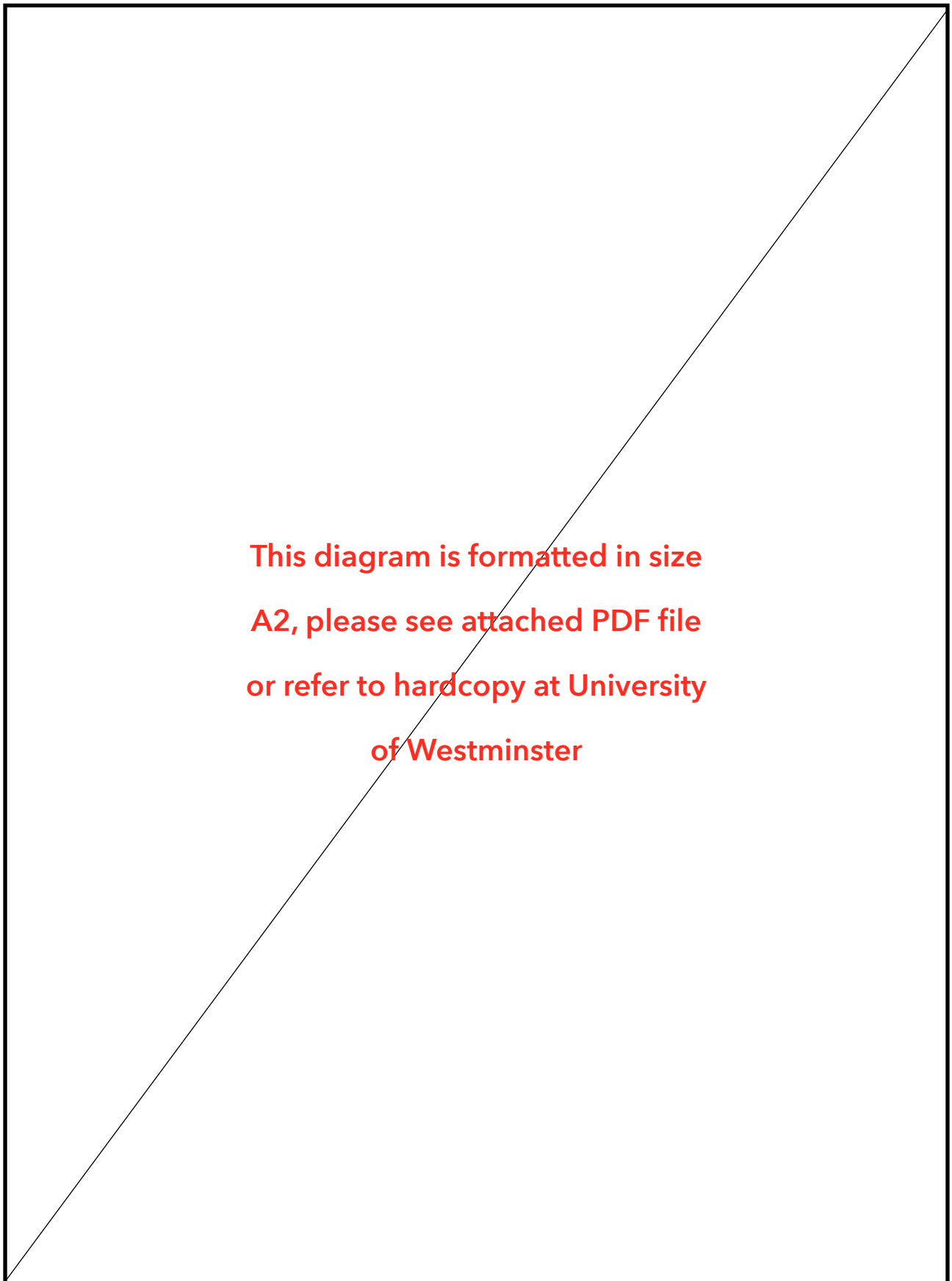
At the same time, during the first decade, threats of eviction were regular, maintaining the population in a constant state of alert. Residents not only had to deal with the consolidation of their own housing, but also remain vigilant and in a constant state of uncertainty.



Contextual

Other risks were associated with the geographical and topographical features of the terrain. As explained earlier, Atucucho is settled on steep slopes and at high altitude. Once the population started increasing, inhospitable areas started to be inhabited as well. This risk is still present, particularly in the sectors of Corazón de Jesús, La Campiña and Laderas del Cisne. Moreover, access to the area also imposed risks, as residents had to walk across steep slopes and difficult terrain everyday to commute to work. The first transport units that served the area were private businesses, which were completely unregulated, and although providing an easier access to the area, they also posed risks to the safety of commuters.

Fig. 5.5 **Lack of adequate housing and land** | Constructed scarcity Layer 1: Analysis of issues in the translocal and transcalar diagram according to their material, contextual, political, social, personal and temporal nature



(b) Analysing scarcity as constructed: translocal and transcalar (key relations and barriers)

The analysis of housing scarcity (See Fig. 5.5) in Atucucho revealed more material and contextual aspects, including strong financial limitations associated with their income, fluctuating rents, transport costs and issues associated with living in the city. It is also associated with the physical restrictions imposed by the typologies of housing they had access to, including flats or subdivided rooms inside houses or apartments. These restrictions would also have social and personal consequences, as it would limit the way residents could subsist and the social activities they could undertake as a family. The diagram also shows how the cycle of supply and demand for affordable housing, helps construct and maintain the conditions that affect tenants.

On the other hand, this material and contextual constraint, very particular of informal settlements, is linked to the legitimacy needed in order to access affordable loans or financial aid, including from the government. It is the type of constraint (the inability to prove ownership or at least possession of the land) that can maintain a scarcity in place. The fact that the settlement was also located in a vulnerable and isolated terrain, exacerbated their access to not only financial means but also materials and labour. This again, proves the importance of the contextual aspect in the study of constructed scarcity.

The diagram (Fig.5.5) also shows how, once residents were settled, the contextual aspect and associated risks of a vulnerable location and terrain, became predominant.

5.3.2 LACK OF BASIC SERVICES AND COMMUNITY FACILITIES

(a) How residents lived this scarcity everyday? Analysing the elements, sites and relations

Condition A: Lack of access to city services



Contextual

The area comprised by the occupation was initially classified as peri-urban. In 1980, the land became part of the green belt of Quito, and its protection and jurisdiction became the responsibility of the the Ministry of Agriculture and Livestock (Lunda and Ruíz, 1993). Most of the land was covered by an eucalyptus forrest and it lacked all basic services available in an urbanised land.

There were three contextual aspects that constituted this condition during the first years of the occupation. The first one was the location of the settlement, settled in a steep slope and isolated from the city. At the time of the invasion there were few settlements in the immediate vicinity, therefore, very few opportunities to tap into existing connections servicing other areas, a practice that was common among invasions at that time.



Political

As explained previously, up until the decade of 2000s, there was no institutionalised approach to address invasions, neither by cooperative means like negotiation or dialogue, nor by relocation or upgrading plans. The only exception was client relations emerging between some settlements and politicians during election campaigns. Nonetheless, for Atucucho the first years were characterised by strong tensions between the settlers and the authorities, including multiple attempts of eviction and clashes during organised rallies.

Another issue that increased these tensions, was the location of Atucucho outside of the metropolitan area. If the authorities were to provide basic services to the settlement, they needed to recognise it as within the urban limit. For these reasons, authorities were largely absent during the first decade of the settlement.

Additional to these tensions, there were conflicts with the nearest neighbourhoods, which had settled as invasions back in 1983 and 1986. These neighbourhoods had agreements in place with the municipality, which allowed them to be included within the metropolitan area, with the condition that they should monitor and stop any attempts to invade further the adjacent land that was outside the urban limit (where Atucucho eventually settled). This situation created violent clashes between these settlements and Atucucho, and impeded for a period of time, any potential collaboration in attempting to access basic services through tapping into existing connections.

Atucucho found itself, thus, with few opportunities to access basic services through dialogue and/or cooperation with authorities or neighbouring occupations.

Condition B: Precarious and demanding living conditions



Material

During the invasion of the land, approximately 1,360 families participated and settled during the night. One year later, it is estimated that the population had increased to approximately 3,000 families, with a steady population growth following in the next years (Lunda and Ruíz, 1993). This steady increase meant that the few resources available, particularly water, were becoming exhausted and contaminated, while the need for other services like sewerage were becoming essential. Residents reported in their narratives how the water streams they utilised at the beginning became strained due to the arrival of more settlers. This situation resulted in contaminated water sources and frequent conflict over indiscriminate use of the resource. Residents had to arrive at early hours of the morning at the streams, in order to secure a suitable spot for washing and residents had to increasingly walk longer distances up the mountain in order to ensure cleaner water. At the same time, with increasing population came densification and problems with sanitation. Many of the residents reported relying on animal husbandry as an income, including pigs, guinea pigs and chickens. This, coupled with a complete lack of sewerage meant that residents started to experience precarious unsanitary living conditions.



Contextual

The difficult topography of the area also posed serious threats to residents during their daily lives. Residents had to deal on a constant basis with crumbling walls, water currents coming into their houses, landslides and roofs being ripped apart from their house by strong winds. This was particularly common during the years where *mediaguas* were the only typology of houses affordable in the settlement.

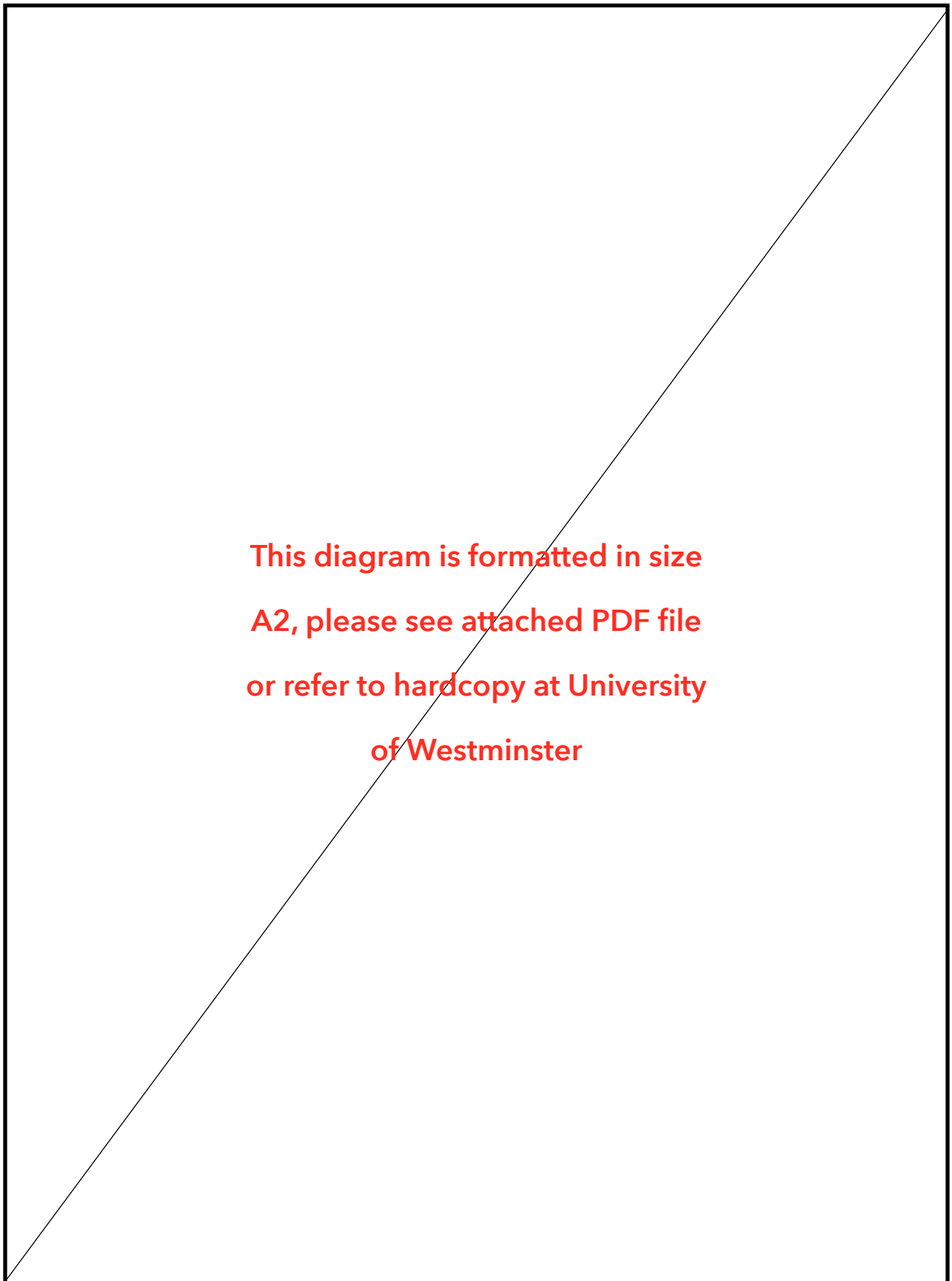
Condition C: Lack of financial and technical resources



Material

In a similar way as the housing situation, financial resources were scarce and difficult to secure, particularly when proof of possession of the land was not available. However, when possibilities for investment would emerge, through small loans or savings, residents would prioritise that investment for their own house. Additionally, during the first years of the occupation, financial investment into collective resources like basic services, was not prioritised or considered sensible by the residents, mainly due to existing conflicts and fear of financial mismanagement of collective funds.

Fig. 5.6 **Lack of access to basic services** | Constructed scarcity Layer 1: Analysis of issues in the translocal and transcalar diagram according to their material, contextual, political, social, personal and temporal nature



(b) Analysing scarcity as constructed: translocal and transcalar (key relations and barriers)

Services in the case study of Atucucho presented a different diagram to the scarcities previously discussed. In this diagram (Fig.5.6) the nature of scarcity included a more diverse and even set of relations, starting with the predominance of contextual, and then shifting to material and personal. It also included relevant political and social aspects. This diagram showed the contested nature of scarcity for an informal settlement emerging from an invasion. The scarcity of lack of services has a direct link to the location of the settlement but also to the tensions caused by the invasion of such an area, tensions that limit what the settlement can do to obtain such services. These tensions were not only, as expected, with authorities but also with neighbouring settlements, all of which actors present specific set of interests that collided at that time with Atucucho. Hence, this scarcity made Atucucho highly vulnerable and with few options but to look inwards and conceive a solution within the neighbourhood using their existing material, contextual and social resources.

5.4 FINDINGS FROM EVERYDAY AND CONSTRUCTED SCARCITY IN ATUCUCHO

5.4.1 CONSTITUTION OF SCARCITY IN THE BUILT ENVIRONMENT IN ATUCUCHO: DISCURSIVE, DISTRIBUTIVE AND SOCIO-MATERIAL

Discursive: the way the approach of the government changed, but not by itself, but influenced by the successful and complex collective strategies of the invasions during the 1980s and 1990s. It changed the discourse of how to refer to and how to work with informal settlements. This is evidenced by the subsequent collaborations and formal provision of services in the last decade between authorities and the settlement, and most importantly, by the emergence of the upgrading programme '*Regula tu Barrio*'. This programme follows the model of community governance and organisation that was evident in the history of Atucucho.

Distributive: The fact that invasions became the way residents could overcome the restrictions imposed by landlords and decrepit housing in the centre, makes a stark contrast to Nairobi in general, where the structure ownership has remained a profitable business that also plays a crucial role in continuously reinforcing scarcity. It is worth mentioning that exploitative mechanisms still exists and have evolved from landlords to land traffickers disguised as 'developers'. However this thesis does not address this most recent phenomenon.

Socio-material: A big part of the scarcity of housing and basic services for informal settlements like Atucucho, came with the lack of affordable means (financial and materials) to make their own quality space of living, as well as the contextual restrictions incurred by settling in isolated and vulnerable areas. However, these constraints were initially balanced by the freedom to make changes and adapt their spaces according to their needs and financial capacity.

PART II - DECONSTRUCTING EMERGING TACTICS UNDER CONDITIONS OF SCARCITY IN ATUCUCHO

After discussing the constructed scarcity marking the lives of residents of Atucucho during the invasion process and the subsequent upgrading of the settlement, this section will address the tactics that originated within these conditions. It will do so by firstly introducing the reader to the process through which residents worked individually and together to mobilised resources for specific causes under conditions of acute limitations. Subsequently it will apply the assemblage and diagrammatic approach to juxtapose the interventions with the constructed scarcity analysed in part I of this chapter. It will do so to draw findings on how these tactics addressed different aspects of the scarcity in question and managed to achieve survival, a positive transformation or reinforced the existing negative condition.

In this way, this section will analyse five key interventions: Firstly, three interventions implemented since the invasion of the land and spanning across the subsequent 15 years of consolidation. These interventions include the consolidation of services, focusing on the communal water system called “Junta de Agua”; the consolidation of communal services, focusing on Child Care Centres and the consolidation of housing, focusing on both collective and individual strategies. Secondly, the section will focus on two more recent and ongoing interventions, implemented in the last 6 years. These include the process of mobilisation for acquisition of land tenure through the Neighbourhood Government of Atucucho , and the consolidation of savings groups into the Community Bank of Atucucho.

5.5. CONSOLIDATION OF BASIC SERVICES: COMMUNITY CONSOLIDATION OF WATER INFRASTRUCTURE (JUNTA DE AGUA¹⁴) IN ATUCUCHO

The Junta de Agua was a committee formed to negotiate and manage water provision. It is referred to as a milestone that changed drastically the settlement, challenged the existing organisational strategies by the leaders and that set the pace for a better way to cooperate and organise themselves.

Fig. 5.7 José Delgado, the Aguatero of Atucucho for 15 years, in front of the former Junta de Agua, where the tanks and main water system used to operate



The Junta de Agua originated after many failed attempts to negotiate water provision with local governments at the time through client relationships. At the same time, more and more families were joining the occupation, hence the natural water streams in the vicinity were not enough to supply the whole neighbourhood. The common response of authorities was that, the site was inhabitable and that a water provision system would be too expensive and challenging due to the altitude and topography of the site. It was projected that water infrastructure would be provided in 40 years from that time. Another factor that influenced the inception of the *Junta*, was the escalating conflicts surrounding the management of natural water streams. Families would often channel the water towards their land for building purposes, contaminating and wasting the precious resource.

¹⁴ Junta de Agua means Water Board or Committee.

It was then that a plan for a Junta de Agua originated. Residents organised themselves and sought assistance from German engineers that previously had worked with the settlement in projects related to children. Using the main water stream located in the highest sector of the settlement as the main source of water, a system was devised consisting of water tanks, filters, the communal 'water house' and the distribution system which consisted of pipes and hoses. The source of water was located in a 'hacienda' or ranch at the top of the settlement, the owner allowed the provision of 5 cubic metres per second. The German engineers taught residents to build filters made of sand and stones. Financial resources were all contributed by community savings, and were used for the construction of the system and the water house, and the subsequent regular maintenance.

A person was appointed as the 'aguatero' or waterman, which managed the communal house and was in charge of the maintenance of the main water system (tanks, filters and main pipes). Communal savings would contribute to his fee, as well as the right to use the water house as his residence. The system would distribute to communal water taps located in different sectors of the settlement and supplying to approximately 20 families each. The hosepipes and elements of each water tap were maintained by each set of 20 families through regular *mingas*. These *mingas* were often done by the women of the settlement, as leaks and clogging would happen during the day when most of the men would work outside the settlement.

Families would be allocated a schedule with a 30min slot every four days to collect the water. This slot could be at any time of the day and night. This generated conflict sometimes, but for the most part, the interviewees expressed nostalgia for this time, in terms of the cooperation and social interaction opportunities that the water taps and the *mingas* provided. Parties and other social activities would be organised in each water tap, as well as more spontaneous everyday interactions.

The Junta de Agua functioned for 15 years from 1992 till 2007, when potable water connection was established in 2007 and the Junta got dissolved. The financial and socio-organisational aspect of this initiative marked a precedent in the history of the settlement and was used in the implementation of subsequent projects.

5.5.1 PRIMARY AND SECONDARY OBJECTIVES

To build a temporary water provision system to deal with the influx of new residents and conflicts originated by the indiscriminate and unregulated use of existing natural water streams.

5.5.2 RESOURCES (ELEMENTS)



People

- A waterman or 'aguatero', in charge of maintaining the main pipes, water tanks and filters. He was selected among the residents and employed by the community water board, or '*Junta de Agua*'.
- Residents organised by communal water taps, in charge of maintaining the pipes and the tap supplying their sector
- German engineers that provided technical assistance for filtering water



Objects

- The water stream located at the highest point of the settlement which acted as main source of the provision system
- The water taps located in different sectors of the settlement. These are considered individual objects apart from the overall system, as they played a strategic role by being distributed in specific sectors that ensured a fair provision.
- The components of the system, including tanks, filters, pipes and hoses.
- The water house where the tanks would be located and where the Aguatero would be reside.
- Receipts and *minga* cards¹⁵ were issued for each family, to control resident's participation in the maintenance and operation of the water system.



Activities

- *Mingas* played a key role in the construction and maintenance of the water provision system. There were weekly *mingas* for general maintenance, and spontaneous *mingas* in the case of leakage and clogging of the pipes.
- Weekly schedules were put in place in order to avoid conflicts and rationalise the use of the water
- A simple saving scheme was used to finance every aspect of the Junta de Agua.

¹⁵ Minga cards are personal cards that record and control resident's participation in mingas and community meetings. Attendance is recorded through stamps and signatures. Minga cards in this case were issued by the Water Board or 'Junta de Agua'.

Fig. 5.8 .An annual ID card confirming the participation of the resident in the Junta de Agua, dated from 1993



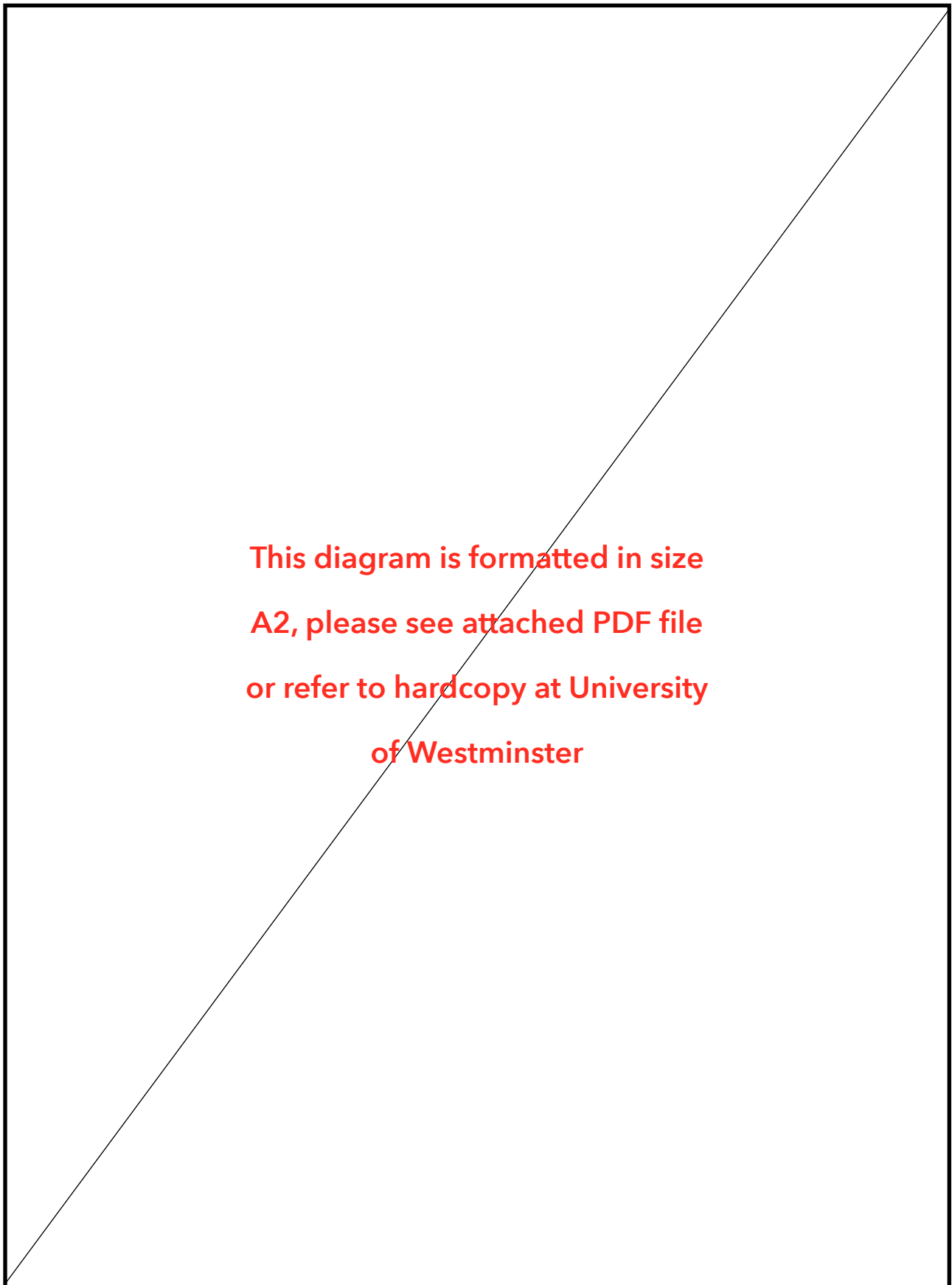
Fig. 5.9 A receipt recording the financial contribution of the resident for maintenance materials, dated from 1996



5.5.3 SITES OF INTERVENTION

This intervention had a specific spatial aspect, meaning, it was implemented in a way that it could serve all the sectors of the neighbourhood through the use of strategically located communal water points. At that time, it was impossible to provide individual connections to each of the households, hence the system was designed to use the natural resources and distribute them as closely as possible to the houses of each resident through the communal water taps. Hence, the main site of intervention was the **neighbourhood** as a whole, while bringing the water resource closer to each of the **households**.

Fig. 5.10 **The Junta de Agua and its impact in the built environment** | Interventions juxtaposed with the constructed scarcity "Lack of access to basic services"



5.5.4 TRANSLOCAL AND TRANSCALAR ANALYSIS OF THE TACTICS: TRANSFORMATIVE, REACTIVE OR REVOLVING TRIGGERS

The diagram (See Fig. 5.10) juxtaposes the Junta de Agua as a tactic with the lack of access to basic services, from which the following findings emerged:

The Junta de Agua as a transformative tactic: This intervention addressed the actual key aspects of the constructed scarcity, in terms of precarious living conditions, by tackling material but also social and contextual aspects of the scarcity. This means that the intervention managed to provide a new service, but also created a social way of working around it, which was vital for its implementation (communal savings and mingas), management (communal taps, aguatero and social surveillance) and maintenance (mingas and savings). The fact that families had to use communal water taps also put pressure on residents to use more adequately the resource by minimising waste and contamination. It also took into account the increasing population, by planning strategic locations for the water taps and a system that could be easily expanded according to the settlement of new sectors.

The diagram (Fig. 5.10) also shows how in terms of the limitation of materials and financial resources for basic services, this intervention had a direct benefit on the experienced scarcity of the residents, by using a system of collective finances to implement and manage the project. This allowed residents to keep investing in their houses as mostly individual projects, but also being able as well to invest a small amount in the improvement of basic services that were now conceived as collective endeavours. This collective approach meant that labour was basically free (through the use of weekend mingas, or spontaneous ones in case of repairs) and materials costs were shared among all the residents. The social aspect of the intervention, through mingas and attendance cards, put pressure on residents to participate consistently and contribute their share when needed. Without this level of coordination and social support and networking, the system wouldn't have been financially and materially sustainable.

Moreover, even in long term, the intervention had huge repercussions at local and government level. This is due also to the fact that it included a strategic and subversive element to it. This subversive aspect was the mobilisation of resources to build a water system themselves and in doing so,

consolidate further their settlement and put pressure on the municipal authorities to recognise them and provide them services as a legitimate neighbourhood.

Moreover, the diagram (Fig. 5.10) also illustrates how, in the absence of collaboration with authorities or neighbouring settlements (see condition A: lack of access to city services), Atucucho found itself with no other choice but to use its existing resources and create its own system of local collaboration and how this influenced structures at higher scales. Firstly, it used its isolated position in a green corridor, which usually would be a limitation, to devise a system where the settlement could use natural resources (in this case water) in a more adequate and sustainable way. The fact that it is located in a green corridors meant that several natural features were available, including several water streams. The effect that this system had, such potential was a slow but strong pressure on authorities to recognise the settlement as a an organised force, capable of undertaking negotiations and collaborative projects. It also had an effect on the expansion of the city, as it urbanised the area and pushed authorities to start providing more services within it.

It also set a precedent and pushed towards new ways of working with informal settlements, hence leading the way for a more institutionalised approach that emerged in later years (see background section in Ch. V, section 5.1.2).

Finally, in terms of condition C (precarious living conditions), the social and collective effort for labour and savings, set a precedent for subsequent government schemes using collaborative approaches with informal settlements, as explained previously.

This intervention also set the precedent for the settlement on how to work together. In particular it showed the capacity of *mingas* at the settlement scale, as well as of collective savings. Moreover, it had a substantial effect in the recurrent conflicts that riddled the settlement since the invasion. The fact that families were now meeting on a constant basis in the communal water taps, started forging an identity across the sectors, people started to know it each other and through daily encounters kept themselves aware of what was going on in the settlement. Social and economic activities also started to emerge around the water taps. For example, this social aspect, perhaps unintended in the inception of the intervention, later influenced the leaders to set up communal houses in each of the

sectors, where other social and organisational meetings could take place once the settlement started to become too big to manage as a unit.

Finally, after 15 years, the settlement did get a formal potable water system, provided through the government.

5.5.5 TRANSLOCAL AND TRANSCALAR ANALYSIS OF THE TACTICS: KEY BARRIERS

The diagram (Fig 5.10) shows barriers emerging mainly within the condition associated with risks and precarious living conditions. The project did required continuous maintenance due to sometimes employing poor quality materials, putting residents in a constant state of alert so that they were able to respond quickly with *mingas* and avoid the waste or contamination of water.

Another aspect perceived as a barrier, was the difficult topography of the settlement, which made some sectors more isolated than others, and even though communal water taps were distributed throughout sectors, some of them were still difficult to access for some families, particularly if they had to carry large containers to transport the water. The Junta de Agua intervention did not include the improvement of these areas that were, and some continue to be, more vulnerable in terms of access and topography.

5.6. CONSOLIDATION OF COMMUNITY SERVICES: SPATIAL TACTICS FOR CHILD CARE CENTRES IN ATUCUCHO

The families interviewed during the fieldwork arrived at start of the invasion or the early stages of the consolidation process of Atucucho, between 1989 - 1993. All of the residents interviewed arrived as part of young families. As explained in the previous section, the initial years of Atucucho comprised a combination of intense mobilisation and hard physical work to slowly and incrementally build roads, drainage and water systems for the neighbourhood. This involved the participation in many cases of both parents in community meetings and *mingas*, on top of their daily jobs, leaving their children in need of care.

Another factor that played a role in the need to create their own child care and educational centres, was the fact that for many years the settlement was only accessible by foot, through a steep and treacherous slope, that was usually covered in mud. This would make it even more difficult for

children to attend schools or nurseries outside the settlement. When eventually rudimentary roads started to be built, transport was still scarce and therefore expensive. Residents would rely on it only for essential travel, such as commuting to the city for work.

Assistance by the government was non-existent at a time where the settlement was under constant threat of eviction, with regular violent clashes between police and settlers, and between groups of settlers was common. Below, this intervention will be analysed based on the story of Digna and the Child Centre of 'Abejitas'.

Digna is one of the residents I interviewed in the sector of La Paz- La Unión. She heard about the 'invasion' through a friend and decided to stop renting and look for a plot in Atucucho. She came with her family of 3 children and husband and her husband's extended family. Her first house was made of plastic and sticks.

Her case stands out as she entered into an 'agreement' or 'contract' that allowed her to improve her house and make a living. Until 2008, there were several Children Centres (CC) in Atucucho, all of which operated from private houses. She always worked as a teacher in these centres from 9.00 to 16.00 and as a domestic worker from 16.00 to 21.00. Her opportunity came when the previous house owner did not want to host the CC anymore and she suggested that she should take it, as she had space and a patio that allowed for extensions and improvements.

She complied and entered into a contract, in which instead of paying her the rent for hosting the centre, the parents would help her with the house, to build and maintain it. She would cover half of the costs and the parents would cover the rest. Every weekend they would all do *mingas* to build/expand or provide maintenance. She signed a 'contract' where she would commit to host the CC for at least 4 years and the parents would commit to do *mingas*. She hosted the CC for a total of 13 years.

Fig. 5. 11 Images from Digna's house and its current layout



Fig. 5.12 How Digna's house changed under the contract



5.6.1 PRIMARY AND SECONDARY OBJECTIVES

To provide adequate spaces to host Child Care Centres in Atucucho and to provide an opportunity for the host family to slowly improve and expand their house.

5.6.2 RESOURCES (ELEMENTS)



People

- **Women**, particularly with children themselves, in possession of spare land and a non-consolidated house or structure.
- **Neighbours** in need of child care, willing to enter a contract and participate in the *mingas*.
- **Staff** would be hired from the same neighbourhood, and in most cases were mothers themselves of children using the CC.



Objects

The key resources in this case are **spare land** and a **non-consolidated structure**. This meant, that the contract could be lengthy, according to the improvement and building works needed, and that there was enough space to extend the structure and accommodate more children in the future. **Financial** resources were also invested to undertake building works and repairs were contributed half by the owner of the structure and half by the parents.

The **minga card** was used as a mechanism to control participation of the parents in the weekly *mingas* to build and maintain the CC.



Activities

The tactics revolved around the concept of *minga*, as explained throughout this chapter. *Mingas* would take place every Sunday for the purpose of planning an extension, building or repairing the structure and the grounds. Both parents could participate, with a percentage of the women taking care of the food during that day. The *minga* was carefully regulated through a *minga* card, using the same system as for the consolidation of other services.

5.6.3 SITES OF INTERVENTION

This particular intervention was geared to fulfilling two needs, a consolidated house for the host resident, and a structure to provide a needed service in the area (housing and services).

"Lack of access to basic services"

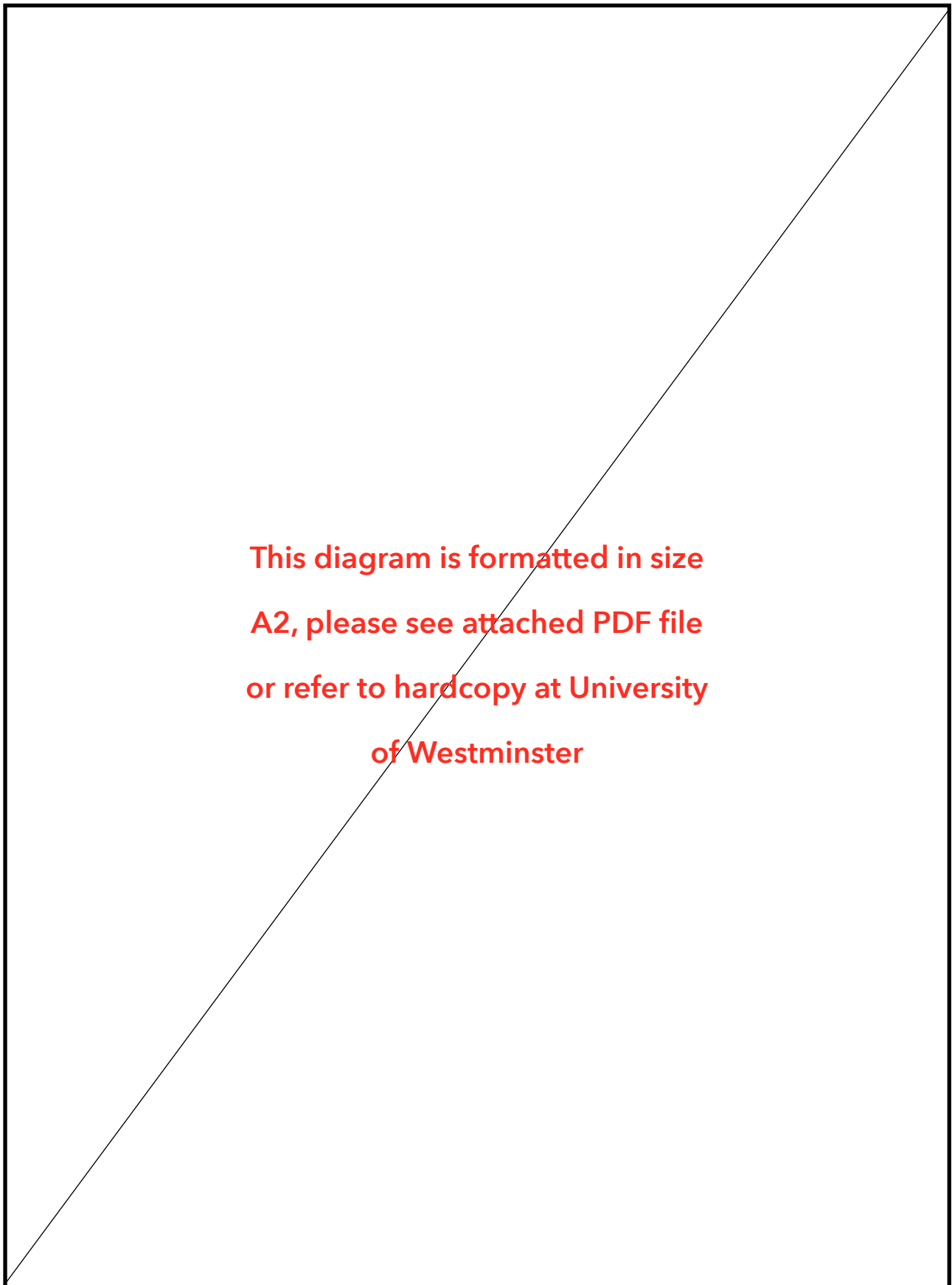
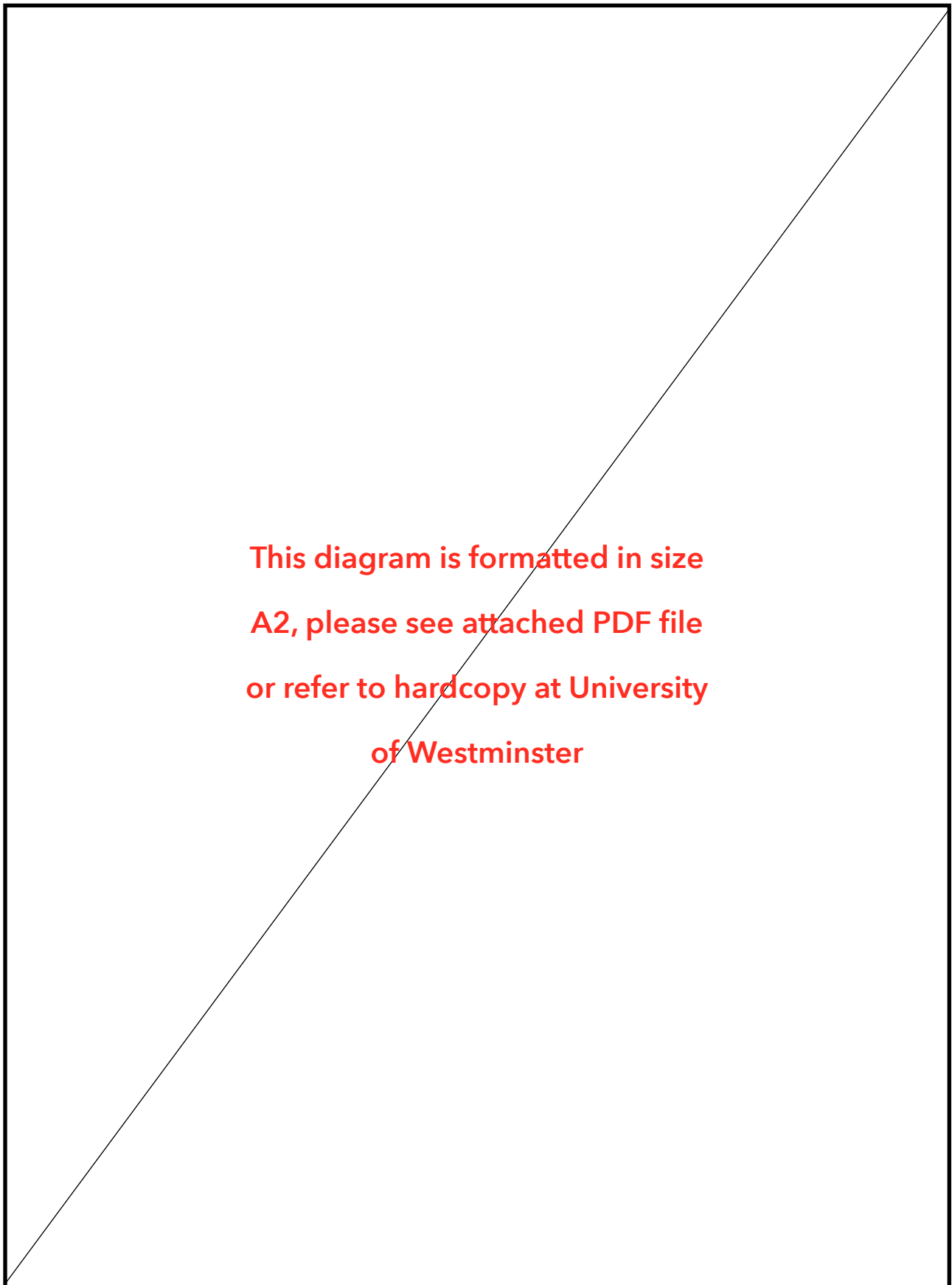


Fig. 5.14 **The child care centres and their impact in the built environment** | Interventions juxtaposed with the constructed scarcity
"Lack of access to housing and land"



5.6.4 TRANSLOCAL AND TRANSCALAR ANALYSIS OF THE TACTICS: TRANSFORMATIVE, REACTIVE OR REVOLVING TRIGGERS

The diagrams (See Fig. 5.13 and Fig. 5.14) juxtapose the Child Care centre with two scarcities, the lack of access to basic services and the lack of access to housing, from which the following findings emerged:

Innovation by trying address two key issues. one individual and one collective, with one strategy.

The lack of land or physical structure to host a CC and the lack of resources to build it, coupled with the need of a family to develop its current temporary housing structure, provided a great opportunity to deal with two types of scarcity in one single way.

The intervention provided the owner and the parents with a financial strategy to invest in the upgrading of their house while it hosted the CC for several years, by using a co-production savings scheme and the use of *mingas* for building and maintenance.

It also provided the social networks needed for the host, to be able to move from a temporary structure to a permanent one. This was particularly important as her husband had left and her children were too small to help with any upgrading.

For the host, moving from a temporary house to a permanent one, also meant she no longer had to guard her extensive land from competitors and land grabbers, as happened to other residents.

However, the biggest benefits were related to the provision of adequate services, as it not only provided a financially feasible option but also provided labour, in the case of basic services, when housing was at the time the main priority for residents. It also directly generated an opportunity for collaboration with the municipal authorities, that in later years, started providing training for teachers and care takers, and eventually provided two child care centres for Atucucho, currently managed by the same women that initiated the private CCs, such as Digna. This was a direct consequence for the settlement, emerging from an initiative that started at a small scale but managed to influence the structure through which the authorities used to relate with the settlement. It influenced the institutionalisation of this approach (partnerships and collaboration) and it helped ease tensions

during the first decade of the invasion. It also changed the discourse through which the authorities used to see Atucucho.

Potential or indirect benefits. The fact that a house was upgraded from temporary to permanent, impacted individually on the host and collectively on the settlement leading up to the eventual recognition of Atucucho. Moreover, an initiative like this one, that included housing but also a community service, would exert even more pressure on the government, evidenced particularly by the eventual recognition and support gained from the Ministry of Inclusion and Solidarity Economy (MIES).

5.6.5 TRANSLOCAL AND TRANSCALAR ANALYSIS OF THE TACTICS: KEY BARRIERS

In terms of housing, the upgrading was mostly dictated by the needs of the CC, hence the end result after the CC moved out, was that not all the spaces were convenient for housing, including some left-over space.

5.7. CONSOLIDATION OF HOUSING: COLLECTIVE AND INDIVIDUAL STRATEGIES

The invasion was organised by two leaders, Segundo Aguilar and Carlos Yacelga. It was planned to take place on Easter Thursday, 31st of April 1988. Easter holiday is the main religious and vacationing period in Latin-American countries, hence authorities would be busy dealing with the festivities. Most of the interviewees stated that they found out about the invasion through relatives and friends and decided to join for the opportunity to own their own plot and build their houses themselves. All of the residents were previously living as tenants, paying substantial amounts of money for very inadequate spaces, subjected many times to abuse by their landlords and with no possibility of improving their living conditions.

The mechanism to join the invasion was simple, you would go the office that Segundo and Carlos set up for the purpose, pay a specific amount (this would vary according to the location and size of the plot) and be prepared to invade on the said day. But the most important condition was to occupy the plot immediately and work on it as an active resource or family project. This meant that families had to build their houses over night, using sticks, plastic and corrugated sheets and consolidate it in the coming months according to their means. In the subsequent days, some families managed to rebuild their houses using rammed-earth, others remained in the plastic houses for several weeks or

months, waiting to have more resources to 'upgrade'. A list would be passed every day, in the morning and at night, to ensure that families were occupying the plot accordingly. Many people got evicted for not complying with this condition and the plots were sold again. This provoked a lot of violent conflict. However, the leaders argued that the invasion was only for those who truly needed a place to live and were committed to improve the place, hence the reason a family had to occupy immediately and start working the land.

The improvement of the settlement started right away through *mingas*. Two community based organisations emerged, the Improvement Committee and the Cooperative of Inticucho, both managed by the two leaders. Entire families were involved in clearing the forest and make way for houses, corridors and streets. This involved digging up to 3m deep holes in the ground to uproot eucalyptus trees. Each family would clear approximately one tree per day. A space was designated for the communal houses in different parts of the settlement, which eventually would become the sectors that exist today. Water was fetched from the mountain river and a nearby reservoir built by a wealthy farmer. Most of the families interviewed started upgrading their wooden or plastic houses after 4-6 years. They built their houses themselves, purchasing (or making) materials slowly and building through family *mingas* every weekend. However, the slab, as a more complex component of the building process, is always done with the neighbours. The neighbourhood is still in constant construction and you can observe neighbours building slabs together. Member of the host family prepare food and assist those doing the building. They see it as an exchange, 'today is for them, tomorrow it will be for me'.

5.7.1 RESOURCES (ELEMENTS)



People

Owners / families

Neighbours

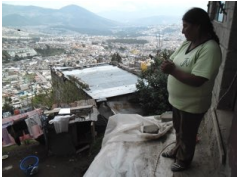


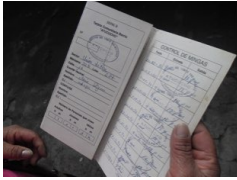














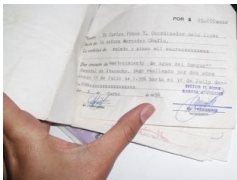

Leaders



Objects

Materials from surroundings and recycled materials and components from homes and factories where they worked. The spatial arrangements would often be inspired by houses where they worked on before. Skills would come from themselves, their neighbours and from local builders.

Fig. 5.15 Individual stories of upgrading in Atucucho

Resident	First Mediagua	Current house	Role in upgrading of neighbourhood	Other uses within her plot
				
Female, sector Corazón de Jesús	Mediagua made of concrete block, current use: storage	Two stories, currently building apartment for rent	Minga card for building of drainage	Poultry keeping in purpose built room
				
Female, sector Planadas del Cisne	Photo of original mediagua, demolished	Three stories, lower ground for storing building materials	Minga card for building of drainage	Water catchment for her terrace crops and poultry keeping
				
Female, sector Corazón de Jesús	Original mediagua, currently used to store gardening tools	Three stories, her sons and families live in each floor	Monitoring list for promoters in each sector	Allotment and water storage
				
Female, sector Laderas del Cisne	Original mediagua, currently used for storage	Three stories, lower floor for rent	Receipt maintenance of communal water taps	Animal keeping, including rabbits

Box. 5.1 The story of Guillermina

Guillermina is a resident of *Laderas del Cisne*, a sector located in the steepest area of Atucucho, just bordering the forrest. She had a job as a domestic worker in the city and used to rent a room for herself, her husband and two children. The place was very small, her children didn't have any freedom to play and run and were constantly getting sick. She was desperate to have her own plot, and when a relative told her about Atucucho, she convinced her husband, took her two children and left everything to join the invasion. She joined at a later stage (one year after the original invasion), hence they had to occupy a plot in the steepest part of the settlement.

"There were no roads, just huge fallen trees. We found a plot sort of plain, and built a shack right there, with zinc sheets for the roof, and small wooden sticks and plastic for the walls. It was just in time for the winter. I will never forget the first night we stayed here, there was a storm and we didn't sleep as we could see the water running below our makeshift bed."

Rapidly, because her husband knew adobe construction, he built their first mediagua, which is still standing. The first years in Atucucho were the hardest of her life. They would bring the water from her husband's workplace in the city. Each of them carrying a container up the hill, with no proper roads. A year later the communal water taps emerged. Three years later, the first vehicle started to access the settlement. They lived in a slightly improved mediagua for 12 years, until she managed to get a loan and start building a new house.

"Everything we have earned we have invested in building this house little by little, sometimes not eating, not buying something to wear, we don't know what it is to go for holidays to the beach. Everything was used to pay small loans to build room after room. But it has been worth it, I have a space for everything I wanted, one floor for each of my children to live as adults, a living room, an allotment, a terrace, even a space for barbecues".

Once they managed to get a certificate of possession and show electricity bills, they got access to a small loan, starting with USD600 to pay for the first slab. She built the current house between her and her husband, and they would do 'mingas' where their neighbours would help them build the slabs. In exchange, she would cook for all of them and also participate in mingas to help build other houses in her sector. They are currently finishing the 4th floor, which they plan to put to rent. She also has a cistern where she stores the water and uses it also for construction and irrigation for her crops.



Guillermina and her allotment located at the back of her house



Their first mediagua made of adobe, still standing. Now serves to raise guinea pigs for selling



The front (below) and the back (above) of the house, with a barbecue area.



Fig. 5.16 **Individual housing strategies** | Interventions juxtaposed with the constructed scarcity "Lack of adequate housing and land"

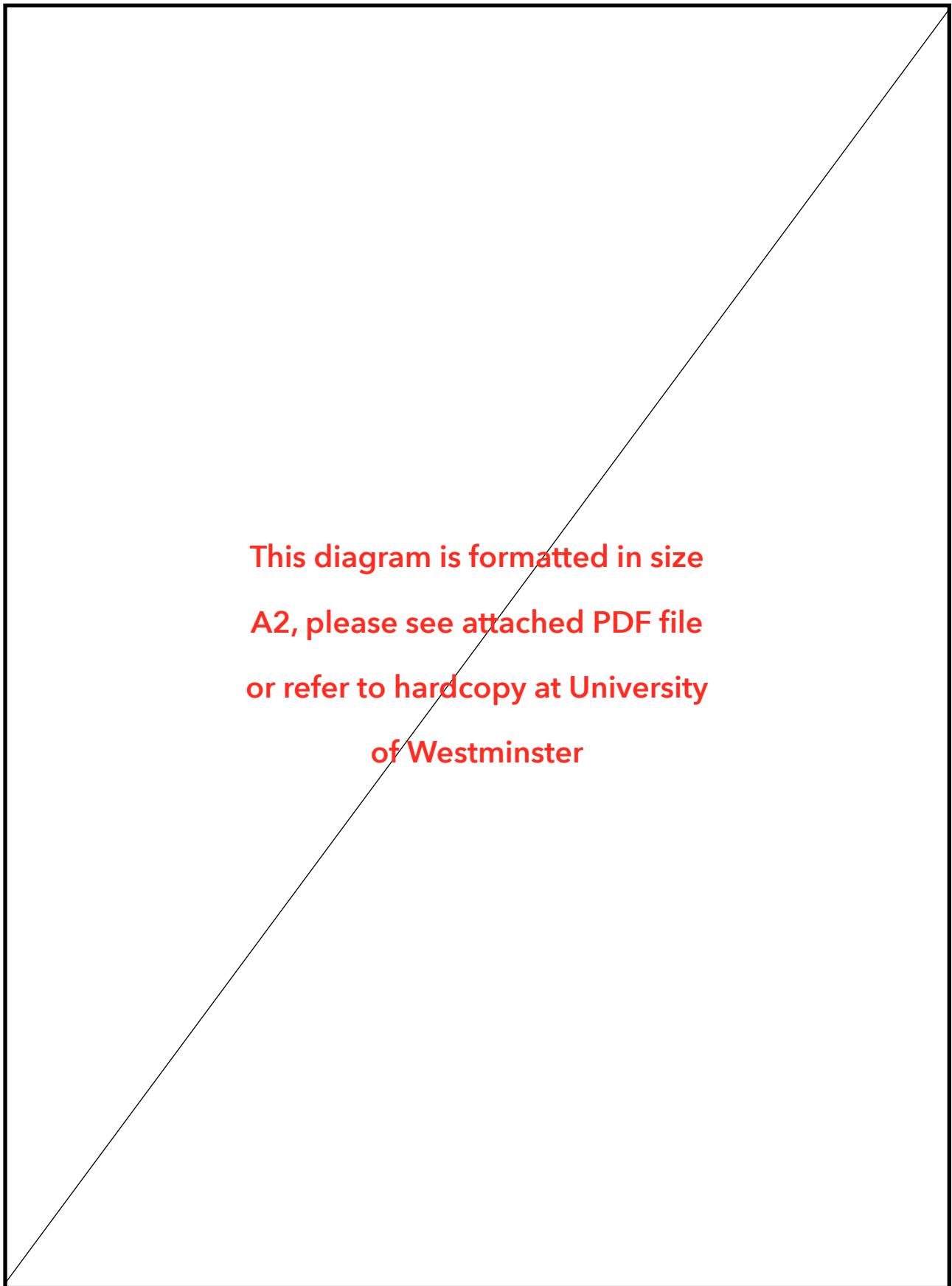
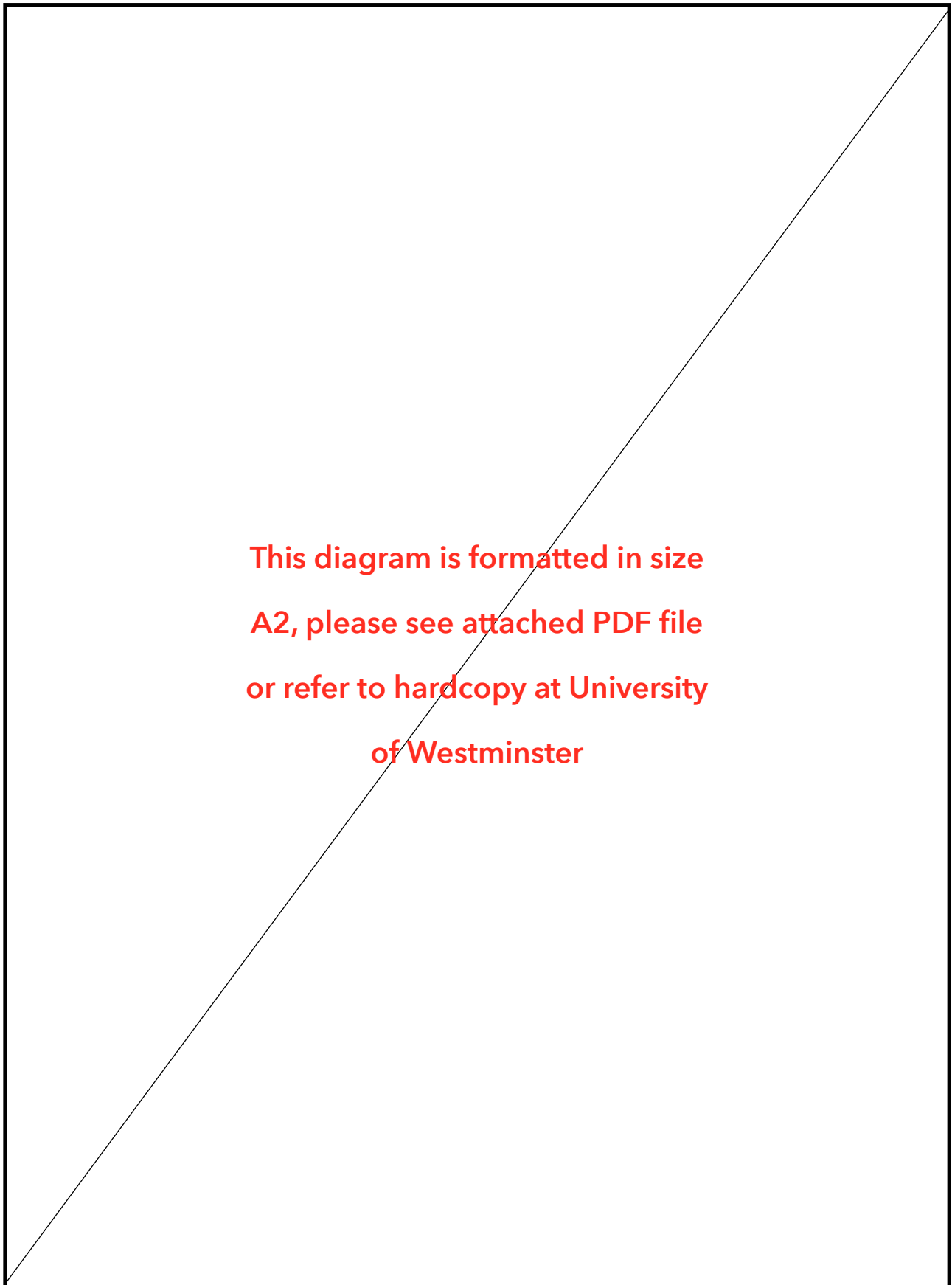


Fig. 5.17 **Collective housing strategies** | Interventions juxtaposed with the constructed scarcity "Lack of adequate housing and land"



5.7.2 TRANSFORMATIVE TACTICS AS CREATIVITY TRANSFORMATIVE, REACTIVE OR REVOLVING TRIGGERS

The diagrams (See Fig. 5.16 and Fig. 5.17) juxtapose the individual and collective housing strategies with scarcity of the lack of adequate housing and land, from which the following findings emerged:

The housing strategy as a transformative tactic: this intervention of the residents broke a cycle of exploitation and limitations that were likewise material and political (tenancy and relation with landlords). The change of typologies that physically constrained improvements, as well as social and economic activities, provided residents with the freedom to use their skills and diversify the way they would generate income or simply live and enjoy their daily life. This change had a positive effect in terms of the available land for agriculture and raising animals, the space for recreation, and the size and flexibility of the internal space of the house. It allowed them to utilise their skills brought from rural life or from working in construction companies.

The strategy of utilising *mingas* to build structural components of the houses, has played a key role in consolidating the settlement and in helping families transition from temporal to permanent houses. This consolidation had a direct effect in the uncertainty of possession of the land, as more permanent structures emerged, it became more difficult to evict. It also proved the capacity of the residents to mobilise and save.

Revolving triggers: In the case of joining the invasion, there was a revolving trigger that impeded the improvement of the quality of the house for a period of time, and for some families, for more than ten years. This is related to the fact that settling into Atucucho families had to start from zero with very little money, materials and social support to invest. Conditions, as explained in the examples, were difficult during the first years, and this is reflected in the diagram as a revolving trigger.

Once settled in the invasion, the revolving trigger shifted to the lack of recognition as possessors of the land for a period of time, which would impede the access to affordable loans from both cooperatives and the government subsidies. However, it is here where the consolidation of services by themselves, including the junta de agua and CC, played an important role in achieving recognition as possessors.

Another revolving trigger that emerged in the diagram (Fig. 5.17), was a result of not engaging with the contextual aspects of the settlement, particularly the settlement of residents in highly inadequate and vulnerable areas, that till this day, remain at constant risk.

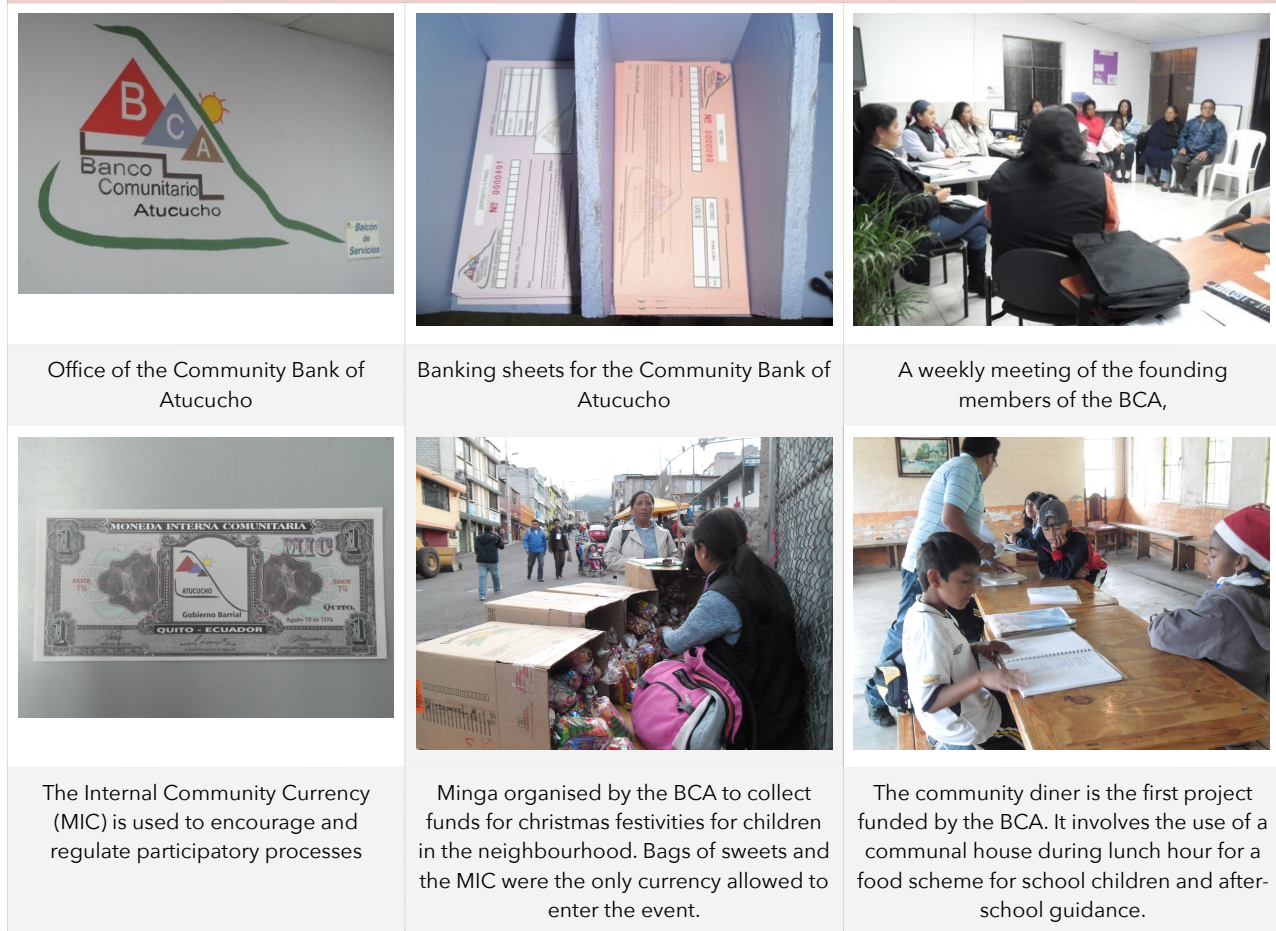
5.7.3 TRANSLOCAL AND TRANSCALAR ANALYSIS OF THE TACTICS: KEY BARRIERS

The fact the invasion, as with all of the ones at the time, was located in a isolated and non-urbanised area, meant that a particular barrier remained in place, even though the location changed, which is the high cost of transport. Likewise, the method of invading the periphery did not change the fact that access to housing in the centre of the city or in well connected and well served areas, remained unaffordable for low-income settlers. Hence, it failed to address or engage with the exclusion that the housing and land market generated at the time.

5.8 CONSOLIDATION OF SAVING GROUPS: THE COMMUNITY BANK OF ATUCUCHO

The Community Bank of Atucucho (BCA) is a financial entity owned and managed by residents of the barrio. It is the first of its kind in Quito and it emerged thanks to the new laws of participation and decentralisation. It is regulated by the Institute of Popular and Solidarity Economy. Atucucho had several small saving groups operating, however their impact was very small and dispersed. Moreover, the majority of the residents make use of small cooperatives to fund the improvement of their houses and some of them cannot even access these type of loans. The bank in this case, could offer an alternative. But the main objective of the bank is to provide a solid platform for improvement of the settlement and for social investment through its utilities. The bank also has an 'Internal Communal Currency' (MIC) used for participatory processes (certificates, mingas, festivities). The bank started to be planned (the statute, legal requirement, recruiting funder members etc) in May 2012 and started functioning at the beginning of November, hence I have been observing the process right from the beginning.

Fig. 5. 18 Images from the Community Bank of Atucucho



There are two main concerns (they say anticipated scarcities) to which the bank is trying to respond at this stage. The first is, that after the titles of the land are secured, the leaders fear the level of participation will diminish considerably, as people will not have a key motivation to cooperate (This is the case with some of the settlements I visited at the beginning and it has also been expressed by other community organisations and authorities from the municipality). This could affect the remaining plans for improvement, hence the bank could use its investment to keep pushing these processes. The second is that once the committee changes leaders (the election is due in August 2013), they want a solid institution behind the improvement of the settlement that does not depend on the good will and intentions of a committee (as this could easily be corrupted as in earlier years).

The BCA emerged from the formulation of the Integral Plan, when issues were discussed of casual and informal labour in the households, which found that the majority of families cannot access formal credit from banks or only to small credits, usually with high interest rates.

The first strategy that was put in place was creating the saving groups, using as precedents the existing groups that were working at a very small scale and completely separately and not articulated with the community objectives or the Improvement Committee (IC). These groups were joined together under the umbrella of Solidarity Economy. This was part of the first strategy of the Integral Plan, of transforming the IC into a GBA, which includes a solidarity economy council. While the regularisation process is on the way, residents continue to save and contribute, but once this process finishes, so does the culture of saving. The objective is that the BCA becomes the unifying entity to take over the titling process, to build incentives and guide the development of economic strategies.

The bank was formed by 14 residents, but this was considered too small and limited. They had to socialise the idea so they started to recruit more people and managed to get 30 founding members. Each of them contributed 100USD to start the functioning of the bank. The second step was to migrate the accounts into the BCA, with those resources they were in the position to give credit. Once the first credits were given, residents started to be interested and wanted to be part of it.

By December 2012, the BCA had 79 active members. These members are divided into founding members, community members (individual residents), organisation members, that correspond to the existing saving groups that now have their bank accounts with the BCA, and the programme members, which includes the different social programmes in the neighbourhood, including the Children Centres. To be part of the bank they need an ID, a utility bill with the location of their plot. They ask a starting saving of 45 USD (the founding members gave 100 USD). With that they can have access to the first credit, which can range in between 300 - 500 USD. The annual interest rate is of 18%, with 500USD credits paid in one year, and 300USD credits paid in 8 months, hence paying approximately 30-40 USD per month.

A percentage of the utilities will be designated for projects within the neighbourhood. This process will be managed by a group that will draw a set of requirements, collect project proposals and evaluate the greatest need and impact. At the moment, as they are starting, this mechanism is still not in place. They expect that in two years they will have 1,000USD to contribute for specific projects.

The bank is guided by a Regulation Code, which has been in the works for more than one year. A lawyer provided assistance for the code, charging 1,000USD just to say it was good. Only four of the

members have academic background, which is one of the barriers they encounter, hence why they had to hire a lawyer. At the moment they are formulating the credit regulation, based on what they are learning these first months.

The Internal Community Currency (MC) it is designed to be rolling constantly, so it has an expiry date. Residents have to use it during a limited period of time, making the currency active and not putting too much strain on the economy of the bank. Residents can pay certificates (i.e. 5USD) with it, or exchange it for gifts, food baskets and so on. MC are only given to those that participate in the community activities like assemblies and *mingas*, but not to everybody, only those that arrive on time for example.

5.8.1 PRIMARY AND SECONDARY OBJECTIVES

- To provide a platform for the further improvement of the settlement and social investment after the acquisition of land tenure
- To unify and reinforce different small saving groups into a consolidated financial entity owned and managed by residents from Atucucho
- To offer a more accessible alternative for loans and financial benefits to the residents of Atucucho
- To establish an independent entity (not dependant on the Improvement Committee or Neighbourhood Government) that can oversee the continual improvement of the settlement.

5.8.2 RESOURCES (ELEMENTS)



People

- Existing savings groups
- Founding members
- Ministry of Inclusion and Solidarity Economy (MIES)



Objects

- Financial assets from founding members
- A communal house
- Utilities/profits
- The Internal Community Currency (MIC)
- A regulation code



Activities

- Regular mingas
- Weekly Meetings of founding members
- Training sessions on financial strategies

5.9 ACQUIRING LAND TENURE: COMMUNITY ORGANISATION AND THE NEIGHBOURHOOD GOVERNMENT OF ATUCUCHO

This section will refer to the intervention led by the new Improvement Committee (active since 2009 till now) that aimed to address the lack of tenure security, despite more than two decades of occupation of the land.

After almost 8 years of not having a coordinating entity and plagued with conflicts and hopelessness about the land titles, the residents had no trust in any authority and no motivation to participate in mingas to tackle the many problems of the settlement. One of the main strategies of the new Improvement Committee was to appoint 'promotores' or promoters for every block. They are the ones in charge of reaching out to the whole population on behalf of the current Committee, building back the trust and coordinating efforts at a smaller scale. Currently there are 260 promoters. Each of them meets with their block every week, they coordinate mingas to maintain the communal areas, disseminate information and provide feedback to the committee. Every Wednesday they all meet in an assembly with the committee to report back on issues in each block.

By 2009, the Improvement Committee was almost extinct, with no motivation to get involved from the population and no credible leadership. The land titling was the only common objective that could 'resuscitate' the committee.

It remained 5 years without a board. Its decline began once residents obtained basic services, especially the potable water. It became almost impossible to attract residents to attend the weekly meetings.

There was a board that remained in power up until 2003. The roles changed but the people remained the same. Residents did not complain about this unlimited hegemony by particular groups, as long as the objectives of acquiring basic services were met.

There have always been two strong groups that have mobilised residents, the one that remained in power until 2003 and a new one that started to get legitimate support after that period. In 2007, after elections finally managed to be organised, this new groups came to power, but throughout two years until 2009, it failed to gain the support of a large sector of the population. Authorities like the MIES, which is in charge of registering each improvement committee and therefore legitimising it by law, did not accept the board as a committee. In the face of this, the municipality stated that securing the tenure and achieving individual titles would be impossible in the current situation of lack of organisation and weak leadership.

2009 was an important year in the titling and organisational process, with the election of new national president Rafael Correa and the new assembly members, which included the mayor of Quito at the time. He called for a general assembly in Atucucho to discuss the titling process and the need for leadership and a board, managed by the municipality. Residents were given the opportunity to decide the path for titling, either they would organise themselves and propose candidates for a new election or the municipality would take charge with little or no input from the neighbourhood. They decided to propose 3 candidates per sector to form a new committee and lead the titling process and needed improvements for the next years. 18 people were selected through an election monitored by the municipality. The involvement of the authorities helped the new board to start building some legitimacy and recognition from the residents. Nonetheless, after the election, this support faded away once more, and they failed to register the board as a legitimate Improvement Committee, a key requirement to obtain regularisation and individual titling. The first year was almost entirely concentrated in obtaining recognition from the MIES, then the second year the struggle also started to focus on bureaucratic paperwork at the municipality for information on plots. In parallel, the committee brought back some old traditions of the settlement, like mingas, religious and indigenous festivities. It was not until the end of 2010, that after pressure from the residents, the MIES recognised and registered the Atucucho Improvement Committee.

With official and legal recognition, the titling process gained a new force, but with this, conflicts started to emerge regarding size of plots, ownership and family and neighbour disputes about the land. The previous committee used to resolve conflicts according to their judgement. The new IC decided to distance themselves from this practice and started to appeal for assistance from the

municipality, from lawyers, surveyors and social workers. In order to get demographic data, topography and size of plots.

The land, owned by the Ministry of Health, could only be sold back to the state through a law that states that the Government and the National Assembly, gives permission to the Ministry of Health, to sell land from the state. Technically this law was in place since 1996, but several financial and political crises during the second half of the 90s decade and the change from sucres to dollars, meant that national and municipal authorities were in constant conflict and unable to reach an agreement on issues of land. Political will in the case of Atucucho was crucial if land titles were to be obtained.

In 2010, the residents, mobilised by the newly registered Improvement Committee, rallied in front of the National Assembly, to demand a reformulation of this law. This reformulation included that the decision of who were the legitimate possessors of the land and the size of the plots would be decided through the municipality. The IC would support this process through the appropriate mobilisation and organisation of the residents and by ensuring their participation in the consultancy by the municipality and facilitating the collection of data. Both parties committed themselves to the new interpretative law of Atucucho.

The law also established that the financial aspects of the titling process would be negotiated directly between the municipality and the resident, ensuring that fraud and financial mismanagement could not take place, like in previous occasions.

During this time whilst consultancies were taking place, the IC could refocus on the other needs of the neighbourhood. They spent two years training the 'promoters' that mobilise each block, on issues of citizen's participation and planning, which allowed them to investigate what residents wanted from Atucucho at this important moment.

By 2012, the time when the fieldwork was undertaken, the diagnosis was finished, and the legal paperwork was been drawn up.

The Gobierno Barrial

Another major development came with passing of a new national constitution in 2009. During the formulation of the Integral Development Plan for Atucucho, the residents became acquainted with the broad parameters introduced in the new constitution and the *Buen Vivir* Development Plan, especially with regards to low-income and informal settlements. Article 248 promotes legally recognised governance structures within neighbourhoods, and considered Basic Units of Participation, and should be governed under the parameters of the Decentralised and Autonomous Governments, in this case, the municipality of Quito. Regulations are provided through the COOTAD, which outlines what a neighbourhood government should be. March 2011, saw the first forum of the Buen Vivir Neighbourhood. Municipal authorities, members of the assembly and representatives from more than 400 neighbourhoods attended. With this, Atucucho became the first GB of Quito as a new governance structure. The IC would become now the GB, organised into 11 councils divided by issues of concern for the neighbourhood. These include Safety, Titling, Children, Environment, Infrastructure, Education, Youth, Culture and Science. The training of the promoters included discussing these issues and the delineation of the councils. Each council has a president, which, once the GBA is legally registered, will also be elected by polls.

Only 6 councils started operating. Environment, Risks, Culture, Education, Sports did not work, and remained dormant. The ones more active are Safety and Children. The different sports in the settlement have their own agenda and did not end up contributing to the council and it lost strength. There are no objectives which require for them to work together, as they are self-sustaining. Capacity building has been successful in the safety council, with the help of the community police and red cross.

One of the powers of the GB, is the Peace Judge, the authority who should deal with conflicts within the neighbourhood. The next step is a code for urban co-living, ruled by the Peace Judge. This is the main objective of the Safety Council.

The titling council has a "sudden death" as it will certainly disappear as soon as all the titles are obtained. This council will then become the Housing Council, which will start regulating the quality of the house unit, with regards to building standards, permits, risks and so on.

The infrastructure council has been dormant after a successful three weeks campaign at the beginning of the year, where residents participated everyday in *mingas* to clean and adapt the drainages and trenches in all the streets of the settlement. The main driver for this activity was the risks associated with the rainy season. Nonetheless, after the intense *minga*, the council went back to being inactive. The main objective of this council for the new future, is the consolidation of a partnership with the provincial government, to secure the paving of the whole neighbourhood. As of now, it has secured the external financing of 70% of the project, with the remaining 30% to be procured from the residents. There are challenges with this project because of motivation and some financial issues with families. The provincial government will provide building materials and technical assistance, while the residents will contribute with machinery. All blocks have to have their savings for this project complete in order for the legal agreement to be signed and the project to begin. This measure has been in place by the GBA to avoid having problems with sections of the neighbourhood in case they refuse to pay once the project has started.

The council of Solidarity and Popular Economy, has been successful in coordinating the existing saving groups across the neighbourhood, providing jobs and also by providing capacity building in coordination with the MIES and other financial entities. The biggest achievement has been the consolidation of the Community Bank of Atucucho, which had just opened at the time of this fieldwork.

The Youth council is comprised of two groups, one focused on arts and another one on production. The projects of the production group have been less successful, including the urban garden and ferro cement roof tiles. The environment council could be reactivated with the adjacent forest, which has now been legally given to the neighbourhood of Atucucho, who should be in charge of managing it. While the council of the elderly is active organising social, cultural and economic activities for the elderly population, including a bakery factory ran by them.

Finally, although GBA is supported by the constitution and the Organic Code of Territorial Organisation (COOTAD), there are still key barriers for its legal legitimisation. The current bottleneck that has delayed the legal registration of the GBA, is that the constitution does not specify which is the entity that it should give the legal permission to the GB (this is disputed between the secretary of

participation within the municipality of Quito, or the Ministry of Housing and Urban Development), it only states that elections of the members of the GB must be elected through the National Electoral Council, just as the president and the members of the national assembly.

In order for the GBA to be sustainable, it is important to settle the judicial aspect and the consolidation of the BCA. It was planned at the time, that 2013 would be the year to put pressure on the national assembly to formulate the article that specifies how to give legal recognition to the Neighbourhood Governments. Only then, a Peace Judge can have jurisdiction above conflict issues and a code of urban living can be formulated and implemented.

5.10 CONCLUSION: WHAT ATUCUCHO REVEALED FROM THE RELATIONSHIP BETWEEN SCARCITY AND CREATIVITY IN THE BUILT ENVIRONMENT?

The complete isolation of the settlement and a constructed scarcity that included material, social, contextual and political aspects, forced Atucucho towards an inward looking strategy. By facing an almost complete lack of collaboration opportunities or tapping into neighbouring resources, residents creating a system that would use the material, contextual and social resources existing within the settlement. These resources were people, natural features, social capital and the few connections they had with other actors (the neighbouring farm and the German engineers working with Plan International).

The power of liberating from exploitative cycles allowed residents flexibility to invest and adapt their resources according to their means and desires. Even if settling in an occupied land brought other types of scarcities (no basic services, isolated from the city, no shelter) it pushed towards collective strategies, created networks for financial and social support, and it gave residents the freedom to choose how and when to invest, according to the means available.

The power of anticipating problems and strategising. Throughout the years, leaders in Atucucho have been able to anticipate when the interest of residents would diminish, and have acted rapidly to encounter other ways to mobilise, for example, looking for common needs and goals to pursue as a settlement, as exemplified with the Junta de Agua and the creation of the Atucucho Community Bank (BCA).

In this conclusion, I would like to dwell on three discussions. Firstly, I want to summarise the findings of the different research areas that have been addressed throughout this thesis and that refer to two of the research questions, specifically: the construction of scarcity and emergence of tactics in informal settlements, and assemblage as an approach to explore both concepts.

Secondly, I want to present these research areas together, and in doing so addressing the research question number three: What is the relation between scarcity, the emerging tactics and socio-spatial change and what theoretical and practical lessons can be drawn from it?

In the same line, throughout this section I will elaborate the above discussions by making specific reference to the comparative findings that emerged from the two case studies in Quito, Ecuador, and Nairobi, Kenya.

Finally, this chapter will conclude with a summary of the contributions of this thesis to knowledge, a reflection on the limitations of this study and the research areas to develop further.

6.1. THE CONSTRUCTION OF SCARCITY IN INFORMAL SETTLEMENTS

6.1.1 EXPLORING SCARCITY AS CONSTRUCTED

This section will discuss the exploration of scarcity as constructed, putting particular emphasis on the lessons drawn from the **distributive**, **discursive** and **socio-material** reading of scarcity in each of the case studies.

(a) Scarcity as distributive

The distributive aspect emergent from the case study of Mashimoni is the lack of recognition of tenants and their rights, and its role in the construction of **maldistribution** of resources (See section 1.3.1, Young 2002 and Fraser 1995). Despite the fact that the majority of residents in Mashimoni are tenants, there are no specific policies, programmes or even tenancy rights that address their particular situation. This maldistribution, has been a legacy of the urban expansion of Nairobi, its original segregational policies, and subsequently the role of land and building companies in trading

with the needs of tenants and profiting from an exploitative system of rental housing. This exploitative system has been carried out and reinforced in the last decades by a structure of power that links government and settlements authorities with community actors such as structure owners and churches. Nonetheless, neither of the two biggest national programmes for housing and infrastructure upgrading deal directly with the highly disadvantage position of tenants in informal settlements of Nairobi, hence exacerbating and perpetuating their scarcity. The diagrams also contributed to illustrate how this maldistribution is spread out across different scales, as it shows the limitations of CBOs like Muungano to engage more proactively with this issue and more importantly, it shows the role of the Area Chief, structure owners and the church in reinforcing this disadvantage position of the tenants.

Another **distributive aspect** that was able to be addressed through this research is the capabilities and freedoms that comes with material resources (See discussion on Ch. I, section 1.3.1, Stiglitz, Sen and Fitoussi, 2009 and Nussbaum and Sen, 1993). The importance of the manipulation of a material resource for social or economic purposes, played a key role in the construction of scarcity in both case studies of Mashimoni and Atucucho. As explained in Ch. IV, section 4.3.2 when discussing the lack of adequate housing, many of the dimensions of the scarcity in question emerged from the inability to use the limited space in a way that could improve the daily life of the residents, both socially and economically, as well as the effect this limitation had in their sense of dignity and social standing in their neighbourhood (See discussion on Ch. I, section 1.3.2, Gough and Kellett, 2001; Kellett, 2005).

Moreover, in the case of Atucucho, the fact that residents decided to change from a rental unit in a central more convenient location in the city, for an isolated plot where scarcity of resources was very tangible, proved to be a better strategy for the improvement of their life and the realisation of their goals in the long term. It also gave birth to a plethora of innovative strategies that came with flexibility in spatial terms but also from new ways of organising and engage socially with each other. The case of the CCs for example, probes how two important needs (permanent housing and a community service) could be addressed thanks to the flexibility of using a plot in the most efficient way possible. This could not have happened if the system in place would have been led by restricted use of housing units (as in profit-driven rental housing) or allocation and use of plots.

(b) Scarcity as socio-material

In each of the scarcity diagrams in both case studies of Atucucho and Mashimoni, material relations were rarely or almost never alone by themselves. The linkages helped establish the multidimensional aspects of specific issues that may be considered mainly material in other circumstances.

However, the most important finding with regards to the socio-material aspect of scarcity, is with regards to the relevance of the **contextual qualities** of a specific settlement, and their role in constructing or being part of scarcity in the built environment. First of all, contextual qualities were rarely articulated by residents when initially discussing scarcity in their everyday life. Perhaps this was due to the lack of familiarity with terms like topography, location, density, slopes and the like. Nonetheless, once these personal narratives were analysed and deconstructed through the diagrams, the contextual aspect emerged as a key issue in almost every scarcity and conditions experienced by residents. For example, in the case of Mashimoni, while discussing the scarcities of lack of adequate sewerage (Ch. IV, section 4.3.1) and lack of adequate toilet facilities (Ch. IV, section 4.3.3), the topography, the density and the key sites of Juja road and the riverside, were identified as key drivers of the reinforcement of those specific scarcities (See as an example Fig. 4.13 in Ch.IV). Moreover, when discussing the interventions from youth groups trying to address these scarcities (See Ch. IV, section 4.5.4), the findings clearly illustrated how by ignoring contextual qualities like location and access, a potentially good intervention fell short of benefiting the most vulnerable residents and underserved sectors of the settlement.

Furthermore, the importance of the **contextual** aspect is also of key relevance for **built environment practitioners**, as they have the tools and knowledge to better identify this aspect and how to better use it to address issues affecting neighbourhoods and cities. It is also of relevance, because a diagrammatical analysis that allows you to see the position and importance of contextual aspects, offers a clear view of where built environment practitioners can be more useful and how they *can* and *should* intervene.

Another finding with regards to the socio-material aspect of scarcity, relates back to the discussion on **social action** and **scarcity** (See Ch. I, section 1.3.1). This focus on social action stemming from the relationship between scarcity and solidarity, also contributes to the debate by identifying values and norms inherent in the choices and actions taken within conditions of scarcity (Parsons, 1937, as in

Turner & Rojek 2001). How can we understand what acts as an incentive for mobilisation and social action and how it relates to conditions of scarcity? This can be answered through the example of Atucucho, where interventions were devised to ease social conflict as well as the mismanagement of specific resources, and also on how the leaders anticipated emerging scarcities and utilised them to mobilise residents.

(c) Scarcity as discursive

With regards to discursive aspect, both case studies of Mashimoni and Atucucho illustrated the influence of exclusionary policies in perpetuating and worsening conditions of scarcity. In the case of Mashimoni, the two most recent and biggest national upgrading programmes offer avenues for land tenure procurement only to large scale settlements, excluding villages and subdivisions like Mashimoni that are both relatively small in scale and have strict and complex limitations to achieve land tenure. In the case of Mathare Valley, the settlement from which Mashimoni is part of, there is evidence of how the two villages associated with the Ministry of Defence reluctance to grant land tenure, are the most vulnerable and have the worst living conditions in Mathare (MUST et al.,2012). While these policies and programmes keep failing to engage with the complexities within large settlements and its subdivisions, there will be precarious living conditions perpetuating throughout. In the case of Atucucho, the first years of the occupation faced similar limitations as Mashimoni, as national programmes and subsidies did not address the emerging settlements in the peri-urban areas. It was only once pioneer settlements like Atucucho started to exert pressure through community-led interventions (See the Junta de Agua and the CCs, Ch. V, sections 5.5 and 5.6) that the government decided to change their discourse and shape their programmes based on the lessons learned from these interventions (See Regula tu Barrio, Ch. V, section 5.1.2).

Another **discursive** aspect that emerged was the limitation of framing scarcity through a one-sided discourse, particularly relevant to how social movements aim to mobilise residents. In the case of Mashimoni, the work of the community based organisation Muungano Mashimoni, is heavily driven by discourse, nonetheless, it is a discourse led by advocacy and aiming to engage with higher levels of distributional and political aspects of scarcity. This means that in most cases, Muungano does not engage directly at the level of experienced scarcity, failing to address the pressing everyday needs of residents. This makes it more difficult for Muungano to engage residents at a larger scale and mobilise them more effectively and it hinders considerably what they can achieve as a settlement

and as an organisation. Furthermore, the discourse focused on the strict limitation of land tenure seems to crush all intents to look for alternative ways to do advocacy or make direct improvements in the residents' lives and the built environment. This shows how, the discursive aspect of scarcity, as stated in Ch. I, section 1.3.1, is key in addressing scarcity, as this example shows how the CBO is highly limited by the way they frame or perceive the solution to their scarcity (i.e. land tenure, adequate housing etc).

(d) Informal settlements as territories of scarcity and the tactics emerging within this condition: A comparative discussion.

This section will address the specific findings emerging from both case studies and how the understanding of scarcity in informal settlements was enriched and informed by focusing on two highly different settlements.

Mashimoni as a case study, was not a particularly expected choice. It had no prominent stories of 'creativity', it hasn't been well documented, and it is considered one of the most deprived villages within the Mathare Valley. However, it was a deliberate choice to focus on a 'difficult' case study, one that was experiencing scarcity at its most acute state, and most importantly, one that seems to be caught in an endless cycle of scarcity for more than 50 years. It became important not only to understand the construction of scarcity in Mashimoni, but also to trace the reasons that this scarcity has become reinforced throughout the years despite the recent emergence of community-led initiatives and numerous NGOs working in the area.

Furthermore, Mashimoni offered the opportunity to explore recent community-based interventions and mobilisation, as a result of the post-election violence of 2007-2008. The study sought to examine the potential of these interventions to break the cycle of the reinforced scarcity of the last decades. Moreover, with the application of the diagrams, it sought to bring recommendations forward for the scaling up or improvement of these interventions.

Atucucho on the other hand, was chosen for its rich history of consolidation, and the complex and highly organised strategies through which residents worked, individually and collectively, to improve their housing and neighbourhood. The fact that the settlement emerged from an invasion of a mountain area, disconnected from the city, with little or no conventional resources in and around the

area, offered the opportunity to explore in more detail the emergence of creativity within conditions of scarcity. Moreover, after the consolidation of the settlement during the last decade, and the crucial period in which the settlement finds itself at the moment¹⁶ new issues started to emerge, mostly related to the manner in which the settlement was planned and managed. The opportunity to witness and explore the consequences, positive and negative, of self-help consolidation strategies, was considered an opportunity to build knowledge on the potentialities of creativity within conditions of scarcity.

Finally, although Atucucho is considered a pioneer settlement in Quito, it hasn't been extensively documented, hence it was the intention of this study to document this case and provide a critical view and recommendations based on the lessons learned from a consolidation process widely regarded as successful.

Isolation of the settlement and its influence on how residents respond. A key observation that emerged from looking at both case studies, is how the interconnectivity of each settlement plays a role in how residents respond to the experience of scarcity. In the case of Atucucho, its isolation, not only geographically but also socially (from neighbouring settlements) and politically (from authorities or even client relationships), forced residents to devise strategies inward looking, using resources available in the area and working together as a source of financial and labour inputs. It pushed the settlement to be self-sufficient to some extent. This finding is also related to the premise discussed in Ch. I, section 1.3.2 on informal settlements as territories of scarcity, which pointed towards a uniqueness of informal settlements in terms of the spatial patterns of production and social and economic processes related to scarcity. For example Simone and Abouhane (2005) identify informal settlements as having a particular logic of habitation and Dovey and King (2011) focused on the particular morphological features arising from scarcity (see discussion in Ch I, section 1.3.2).

On the one hand, Mashimoni, a centrally located settlement, illustrates a logic of habitation led by exploitative rental housing, high density and no emphasis on providing or improving basic services. This situation keeps the settlement continuously caught in a cycle of densification and stagnation of housing strategies, despite being bordered by an important highway, its proximity to the CBD and the potential tapping into service connections within its surroundings. On the other hand, Atucucho,

¹⁶ At the time of the fieldwork, negotiations were finalising, after 23 years of struggle, to finally acquire individual land titles.

as a peri-urban settlement, was a geographically, politically and socially isolated area. For several years, it had no possibility to access formal services or even tap illegally into services from its surroundings. This complete isolation and actual scarcity, required leaders and residents to reconfigure how to provide basic services and houses for themselves without the assistance of authorities or neighbours while at the same time, trying to exert some pressure on the government.

Following the last point on Atucucho, the findings, particularly the strategies of the CCs and the Junta de Agua (See Ch. V, sections 5.5 and 5.6), support Baltazar and Kapp's literature on how urban informality with no access to mainstream means opens the possibilities for other ways of acting (See discussion Ch. I, section 1.3.2, Baltazar and Kapp, 2007 and Kapp et al. 2008). If Atucucho had had the opportunity to tap into the water connections of neighbouring settlements or had had assistance from politicians using clientelism relationships, they most likely wouldn't have devised the Junta de Agua and the emerging social and organisational aspects that proved essential in its upgrading in later years. In contrast, Mashimoni has been the recipient of a number of projects originating from client relationships, which have failed because of unfinished or obsolete infrastructure and lack of maintenance and management.

How residents respond when the scarcities are individually or collectively experienced. Temporal housing was conceived as an individual effort, that had to be done progressively in order to minimise the possibility of land grabbing by competitors or eviction by authorities. The strategy of invading and progressively consolidating since day one, was a leading tactic with both individual and collective benefits.

Moreover, once financial resources started to slowly accumulate in order to invest in more substantial improvements to the houses, a collective effort was needed in order to progress. This was done through *mingas* for building structural components of the new houses, as explained in Chapter V (section 5.7). This strategy was also impelled by the limitations of financial and materials resources as well as lack of technical assistance.

In terms of morphology and the influence of processes of scarcity on it, in both cases it has led to densification. In Mashimoni through the allocation of land for profit-driven rental units, and on Atucucho by using and working all available land immediately in order to avoid land grabbing or

eviction. In the latter, the issues with not considering open and public spaces as a priority, can be seen now as the settlement struggles to find spaces for social activities. This morphologically negative consequence of processes of scarcity driving the spatial formation of a settlement (in this case the imperative of consolidating as soon as possible), is also shown in the diagram discussed in section 5.7 on housing strategies. This situation, shows how a considerable section of the settlement unsuitable for housing was inhabited in order to work all the land possible, and now remains in constant risk of landslides.

The findings in Chapters IV and V, also contribute to the premise stated in Chapter I (See section 1.3.2) that **informal settlements constitute key scenarios to draw new lessons for the built environment**. On the one hand, it shows how the flexibility offered by the temporary nature of structures and land, becomes an opportunity for residents in constant need of safety nets and opportunities for income generation as well as social activities that cannot be undertaken in their own houses. On the other hand, this same flexibility, when approached in solely an opportunistic way and without a strategic approach, becomes short term and short lived, with few possibilities to exert long lasting change in the lives of residents and therefore perpetuating a cycle of debts and survival strategies.

The case of the Junta de Agua in Atucucho, showed how through a very physical intervention, shaped by social and economic processes within the settlement, it was possible not only to provide a basic service, but also contribute to key social processes that shaped how the neighbourhood worked together from then onwards. It created the type of social capital that maintained a neighbourhood aware of its issues and therefore more capable of addressing them collectively. At the same time, the provision of a formal system of potable water, did not take into account the social components of the communal system. This generated a slump in the collective process of upgrading, where residents started to slowly retreat to their own issues and found themselves less preoccupied with collective problems. Perhaps, a state of abundance created by the formal provision, in a very top-down approach, created a social scarcity, as evidenced by the crisis of leadership that emerged in the following years.

With regards to the discussion in chapter I pointing towards a recognition of **resident's experience to enrich literature on informal settlements** (See Ch. I, section 1.3.2), the methodological approach

managed to engage with the resident's experience to some extent. But it also illustrated how the articulation of scarcity in a certain way also facilitated the perpetuating of that scarcity. It shows how experienced scarcity as articulated by residents, needs further input from other methods in order to add a critical view that enriches the responses deriving from such articulation. This was more clear with the contextual aspects particular to each settlement, that, in the case of this research, are not addressed at all by residents's narratives. Nonetheless, through the analysis the contextual aspect proved to be a key issue in all the constructed scarcities that were explored. Hence, this findings probes that engagement of residents in the construction of knowledge about their own built environment needs to be enriched by other types of analysis that uncover key aspects that perhaps are difficult to articulate by residents or not differentiated in daily life.

6.1.2 AN ASSEMBLAGE APPROACH TO THE STUDY OF SCARCITY AND CREATIVITY: A DISCUSSION ON METHODOLOGY

In this section I would like to discuss the methodological contributions of this research firstly, to the study of scarcity in the built environment, and secondly, to the use of assemblage as an approach to examine urban issues.

(a) Lessons from applying an assemblage and diagrammatical approach to the study of scarcity

I would like to start this discussion with the relevance of this methodology to the understanding of constructed scarcity. The diagrammatical approach offered the opportunity to engage efficiently with the rather complex concept of assemblage. It did so by visualising scarcity at multiple scales and layers, and not dictating priority through scales but through **sites of experienced scarcity** (i.e the house, the corridors, the open spaces) and through the **relations** between elements (i.e. political, material social, contextual, temporal, and personal). This **multiple** and **layered** visualisation made possible a more dynamic overview of how scarcity functions, where there key **issues** and **barriers** are located and where the potential **entry-points** for intervention reside. However, this also entailed that diagrams would be complex and possibly saturated. I made the deliberate decision to leave all the findings in the final illustration of constructed scarcity, and only prioritise them once more layers of analysis were juxtaposed (i.e layers of key relations and actors). With this, I tried to address the limitations stated in Ch. II (see section 2.2.4) regarding the danger of being reductive and focussing only on small conceptions of change. I managed to illustrate as much as possible the connections of

experienced scarcity to politics and wider processes, while also providing some limits (through the use of scales as backgrounds and layers for different data) in order not to become indefinitely open.

At the same time, the operational aspect of the diagram, provided me with different entry points to address or explore a scarcity or an intervention and to juxtapose both. I decided to focus on illustrating layers of key issues (the ones more complex and interconnected and hence with more influence in the construction of scarcity) in order to juxtapose interventions and analyse how these managed to address or not the key aspects of the construction of scarcity.

(a) Contribution to the literature on assemblage and urban issues

During the critical assessment of assemblage as an approach to understand scarcity (see Ch. II), it was clear that the current debates are polarised in those who see it as just a descriptive, non-critical tool, and those who argue for its capacity to engage critically with multiple scales. However, even the literature supporting the qualities of assemblage as a critical approach, can often fall into complex jargons and concepts that are difficult to apply to everyday circumstances and daily life in the city. Moreover, within this complexity, the links between the micro and the macro are often difficult to trace and understand.

In response to this, this thesis argued for a diagrammatical approach to visualise the construction of scarcity and how it operates within a specific settlement (See Ch. III, section 3.2). As a result, the findings discussed throughout this chapter were directly generated by the use of diagrams as analytical frameworks that successfully navigate across scales and link micro realities to macro processes.

The diagrams and the assemblage approach explored within this thesis are successful in merging a detailed ethnographic study, based on personal and collective stories, to wider urban and political processes. This is a direct contribution that can enrich and expand the literature on assemblages and make it more accessible to built environment practitioners.

At the same time, it responds directly to the debates surrounding assemblage about its lack of contribution to critical urbanism (See Ch. II, section 2.2.4, Brenner, et al., 2011). The scarcities analysed in Mashimoni and Atucucho through the assemblage and diagrammatical approach, are

each composed by narratives emerging from the residents themselves. Subsequently, these narratives are analysed and linked clearly and critically to the policies, the resources, the practices and spatial circumstances that create and reinforce them. The diagrams resulting from this analysis can be considered as maps for critical discernment, maps that will allow you to think critically of the settlement and even the city, without losing touch with the realities of the people that inhabit them.

6.2. SCARCITY, EMERGING TACTICS AND SOCIO-SPATIAL CHANGE: PRACTICAL AND THEORETICAL LESSONS

6.2.1 SCARCITY, EMERGING TACTICS AND SOCIO-SPATIAL CHANGE

The discussion in Ch. I (see section 1.3.3) pointed towards a balance between local tactics of resistance and being more strategic by addressing the barriers that maintain conditions of scarcity. The findings on each case study support this assertion in the following way. Firstly, with regards to the case study of Mashimoni, all the interventions discussed had some level of benefits for the local population by addressing some of the components, particularly material and in a minor level, social, of *experienced* scarcity. Nonetheless, none of them dealt with contextual issues or with the main barriers in the construction of the scarcity they tried to address, and in doing so, managed to reinforce in some cases the scarcity itself. However, this does not mean they did not have a transformative aspect, but that managed to achieve socio-spatial change only on a short or medium term. The key lesson from the interventions in Mashimoni however, is that of the importance of engaging with collective needs at different spatial scales, whether is engaging at the settlement level (as in the case of the cleaning event) or at the corridor level (as in the case of Ndasha's communal shower) has a key potential to slowly overcome barriers, scale-up initiatives and influence structural power relations.

On the other hand, in the case of Atucucho, all the interventions encompassed a level of subversion and resistance, coupled with an strategic agenda and moreover without overlooking the immediate needs of the residents. In doing so, in coupling resistance, strategy and immediate needs, leaders and residents managed to mobilise a population and encourage involvement at different levels for both individual and common goals. This is evidenced in each of the interventions, for example the Junta de Agua emerged from a collective need of the resource and complete absenteeism from the government or neighbouring settlements. Hence the strategy included a large scale system of

provision that gained visibility for the settlement and therefore put pressure on authorities, while creating a complex organisational and social strategy for the implementation and maintenance of the system, and in doing so, providing a relief of an immediate and pressing need relevant to every single inhabitant of the settlement (provision of water). Likewise, the Child Care intervention explored in Ch. V (see section 5.7), is a perfect example of a creative strategy that managed to deal with both individual (as in housing) and collective (as in community services) needs by using existing resources efficiently and managing in the process, to put pressure in the authorities. On the other hand, the CBA, a more recent strategy, is trying to engage with an alternative way to do finances that addresses the specific needs of low-income settlements while also anticipating an imminent scarcity of participation once the land titles are issued. Although this research could not assess the performance and long term effect of this intervention, it explores it as a pioneer intervention that shows the consequences of the two decades of consolidation of Atucucho through social and organisation means.

6.2.2 LESSONS FOR POLICY MAKERS

One of the lessons this study brings forth for policy makers, is how it illustrates the benefit of engaging with local realities, particularly the **experience of scarcity**, in order to make policies more implementable and to use resources (human and financial) more efficiently. The case of toilet facilities in Mashimoni is a good example of how a good policy could actually benefit from a careful consideration of experienced scarcity in the settlement that it tries to address, meaning, not only focusing on the material deprivation (the lack of actual adequate facilities) but the political (the role of private owners), contextual (the difficult topography and vulnerability of specific clusters) and the social (the potential of youth groups, individual agents and other CBOs in taking local ownership and being partners in the process). Therefore, this analysis of scarcity beyond its material nature (hence constructed) offers the potential to assist in policy making that responds to local realities or facilitate the appropriate and efficient implementation of already adequate policies.

Moreover, the findings in the case study of Atucucho, that refer to alternative ways of formulating systems of provision of services such as the Junta de Agua and the CC, shows how a different way of engaging with a problematic can offer lessons for financial and social benefits that can make projects more sustainable in the long term. This is the case with the Junta de Agua, where an alternative service was eventually substituted with a conventional and formal one, creating an abundance of the material resource (potable water) but without taking into account the social and organisational

aspects of the alternative system and subsequently destroying a invaluable source of social interaction and social capital. This resulted in a series of new scarcities of the social kind, including difficulty of mobilisation, loss of collective life in the streets and disconnection between neighbours as well as emergence of some social conflicts including street crime.

6.2.3 LESSONS FOR URBAN DWELLERS

The lessons this study elicits for urban dwellers, relates to the need for a horizontal critical reflection of issues, instead of looking at problems in isolation. Mobilisation for example, cannot be divided from pressing needs. Both cases of Mashimoni and Atucucho illustrates the importance of finding a balance between advocacy for larger goals like land tenure, and everyday needs. Community leaders need to understand, engage with and even anticipate sometimes the issues that move, motivate and drive people to join and participate in the longer term.

In both case studies, youth were more driven by job opportunities and fear of becoming 'idle' or non-productive. Youth showed various levels of commitment, which was mostly driven by its potential financial gains. They also showed the highest level of entrepreneurship and drive. This shows that leaders and CSOs need to include young people more formally and cultivate and harness their skills as future leaders of their communities while balancing the pressing needs that drive them to organise in the first place.

6.2.4 LESSONS FOR BUILT ENVIRONMENT PRACTITIONERS

The lessons this study offers to built environment practitioners include the visualisation of built environment issues in a multidisciplinary and multi-scalar way. Firstly, the scarcity diagrams, show the two aspects more relevant to built environment practitioners (material and contextual) in parallel to aspects relevant to other disciplines (political, social, temporal, personal). The understanding of the linkages between these aspects allow for a better input from practitioners that want to address localised interventions while appreciating their relation to other issues and their potential impact in peoples lives. It also allows for a better understanding on how to partner with other disciplines and actors, and how to build on collective intelligence and resources already existing in the settlement.

Moreover, the findings and the methodological approach illustrate the importance of making use of the skills of built environment practitioners to better understand and inform not only material

qualities (building techniques, building materials) but also contextual qualities (addressed through design and planning) and their role in improving systemic conditions like scarcity in the built environment.

6.3. RELEVANCE AND LIMITATIONS OF THIS STUDY AND RESEARCH AREAS TO DEVELOP FURTHER

6.3.1 SUMMARY OF CONTRIBUTIONS TO KNOWLEDGE

The contributions and relevance of this study, explained throughout this chapter, can be summarised as follows:

Firstly, it offers **concrete examples** of how scarcity is constructed in the built environment based on resident's experiences and linked to city wide processes and policies. Furthermore, it illustrates how the absence of external assistance gives birth to strategies that differ from mainstream approaches of service provision, while also demonstrating the social and organisational benefits arising from them (in the case of Junta de Agua) and the political pressure they can exert leading to actual provision of services by authorities (in the case of the Children Centres in Atucucho). The fact that the findings are relevant to **multiple spatial scales**, offers great contributions to the practice of policy makers, built environment practitioners and urban dwellers working in community mobilisation.

Secondly, this research explored and developed a **new methodology** composed by a detailed ethnographic approach and a highly visual assemblage and diagrammatical analysis. This methodology managed to address gaps that were identified in the previous and current literature on scarcity (the lack of socio-spatial aspects of scarcity, as in Ch.I section 1.3.1) and the literature on informal settlements (the lack of engagement with ethnography and resident's perspective on their realities, as in Ch. I, section 1.3.2).

Thirdly, this study contributes to the current literature and debate on assemblages in critical urbanism, by further developing the concept and applying it to understand both, personal stories and experiences of urban dwellers, and the political, distributional and spatial aspects constructing these experiences. It offers visual and analytical representations of grounded and systemic realities, therefore eliciting critical reflection on highly complex urban issues. Furthermore, it makes

assemblage a more accessible term to engage with and it increases its potential to be operational in policy making, neighbourhood planning, design and community mobilisation.

6.3.2 LIMITATIONS OF THE STUDY

The difficulty to unveil more detailed mechanisms of power regarding land allocation, land grabbing and influence of actors within the community. These topics are highly sensitive and could not be addressed directly as such during interviews with government authorities, the area chief and even residents. Therefore, knowledge and data on such topics, emerged through conversations with experts, participatory observation of daily processes during the fieldwork throughout 7 months and secondary data on the subject. Hence, such specific data within the diagrams was constructed with reliable information but in less detail than other topics that were addressed more directly and which mechanisms were able to be drawn more explicitly. Based on this, a more detailed study is needed to unveil the intricacies and deeper mechanisms that drives land allocation, land grabbing and the influence of community actors such as structure owners, churches and schools.

With regards to the case study of Atucucho, the analysis of the construction of **scarcity was done through a historical analysis** based on personal narratives and secondary data. This included in-depth interviews and transect walks with the residents that originally invaded the area and participated actively in its upgrading, and the analysis of a detailed research study documenting early years of the occupation. However, during the analysis, it was possible to observe the difference between the diagrams emerging from Atucucho, which were less detailed, and those emerging from Mashimoni, where scarcity was present and tangible during the period of my fieldwork and where ethnographic methods could grasp more easily the daily narratives of experienced scarcity.

Another limitation of this study is that the impact of interventions and emerging tactics is more speculative, as it needs support from **longitudinal studies and quantitative data**, as well as feedback from residents in the same way they contributed to build up the narratives of experienced scarcity.

At the same time, it is important to mention, that each of the diagrams represent a moment in time, and should be considered as **situated knowledge** and not a picture of the absolute reality of the settlements at all times.

Finally, the last limitation concerns the fieldwork based on the postcolonial approach as discussed in Ch. III, section 1.3.2. The **co-production of knowledge** with the residents stopped at some point following the conclusion of the fieldwork. The knowledge started being constructed in partnership with the residents, but eventually, the production of knowledge in the second stage shifted back to my responsibility. Although originally planned, the formulation, testing and consolidation of the diagrams was not possible to undertake in collaboration with the residents as this would have entailed a second fieldwork in each of the case studies.

6.3.3 RESEARCH AREAS TO DEVELOP FURTHER

There is the potential to explore further the operational aspect of this methodology to devise new theories and practical approaches. This could be done by coupling this methodology, which is heavily based on qualitative research, with quantitative methods and longitudinal studies (as explained in the limitations), in order to make the findings more general and replicable, instead of being only context specific or situated in a moment in time.

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